

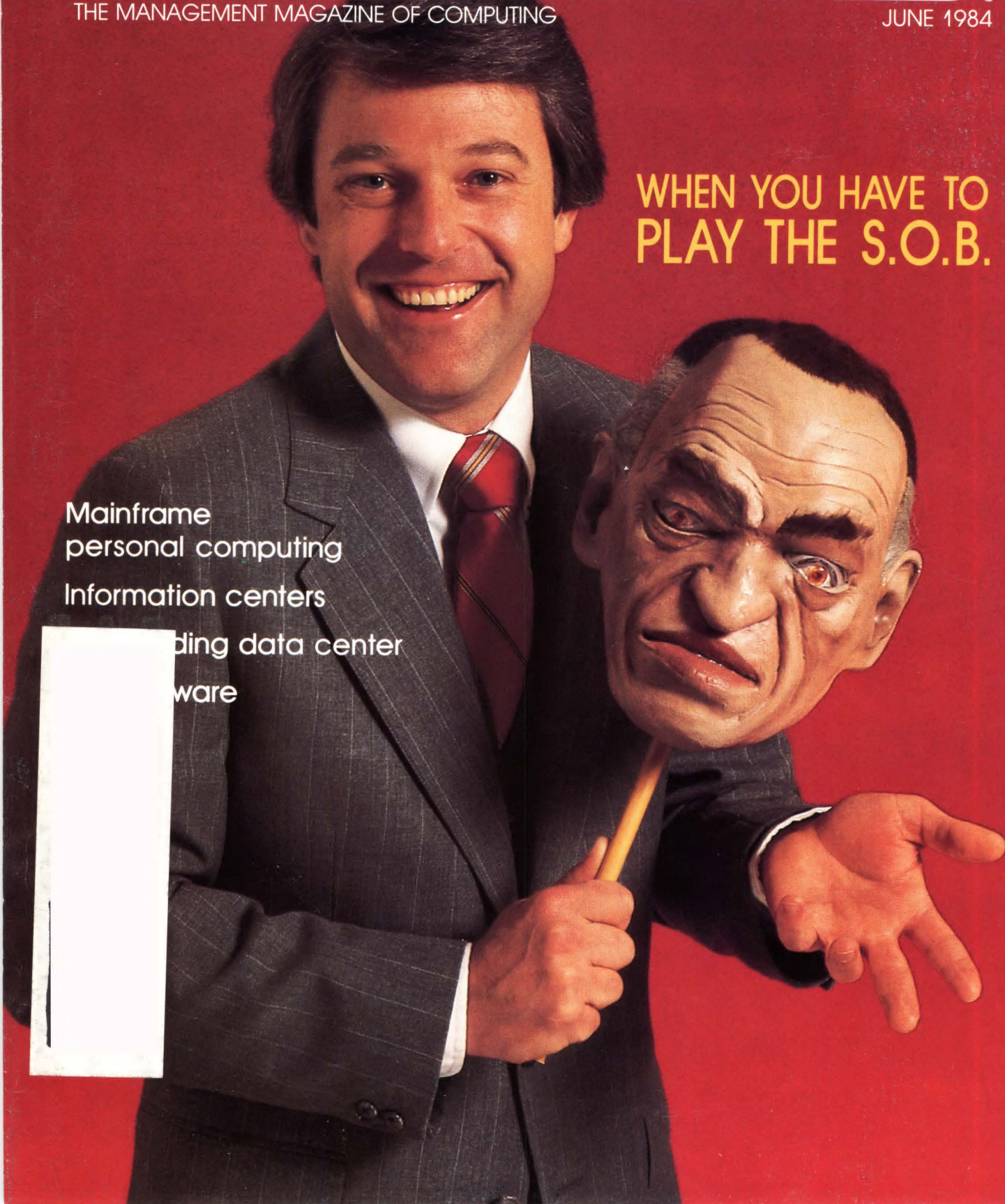
COMPUTER DECISIONS

THE MANAGEMENT MAGAZINE OF COMPUTING

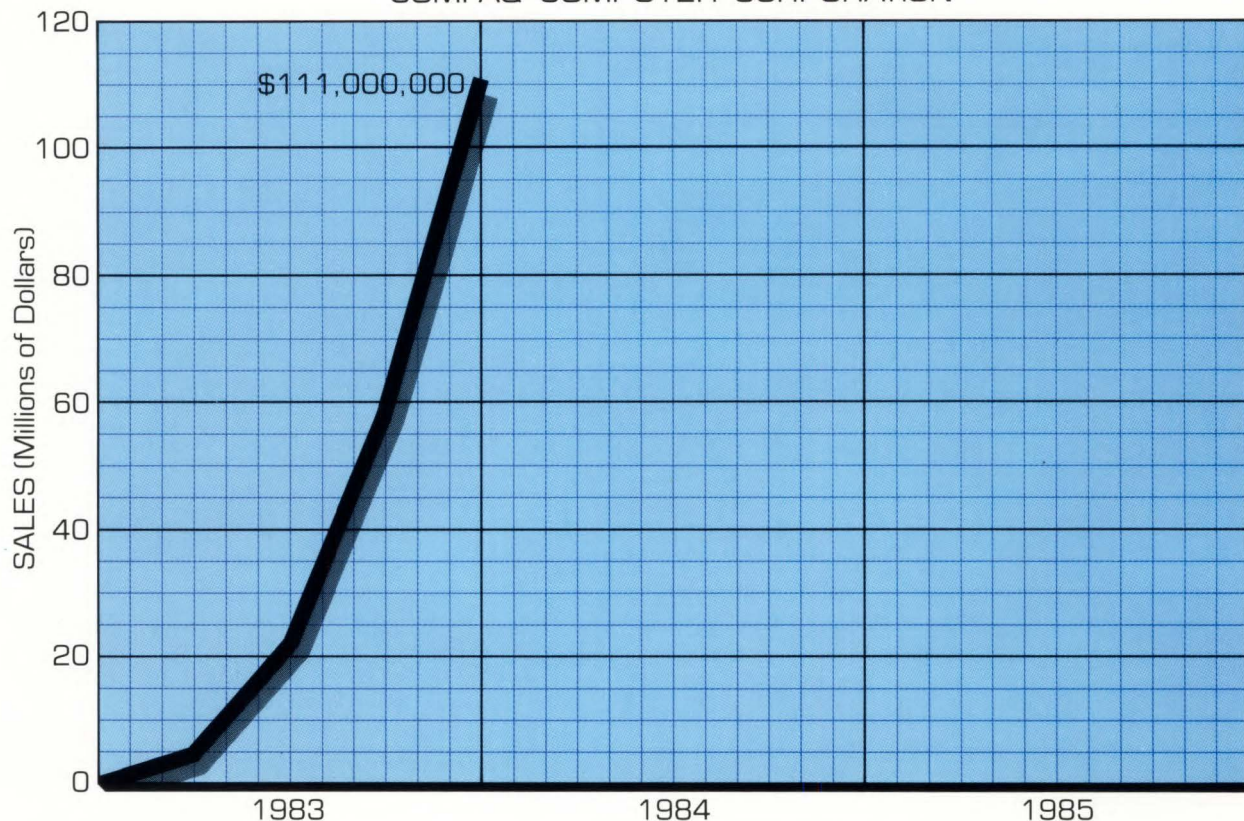
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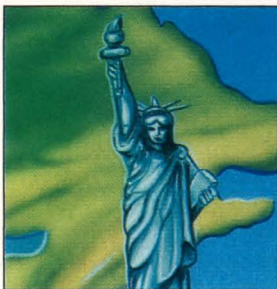
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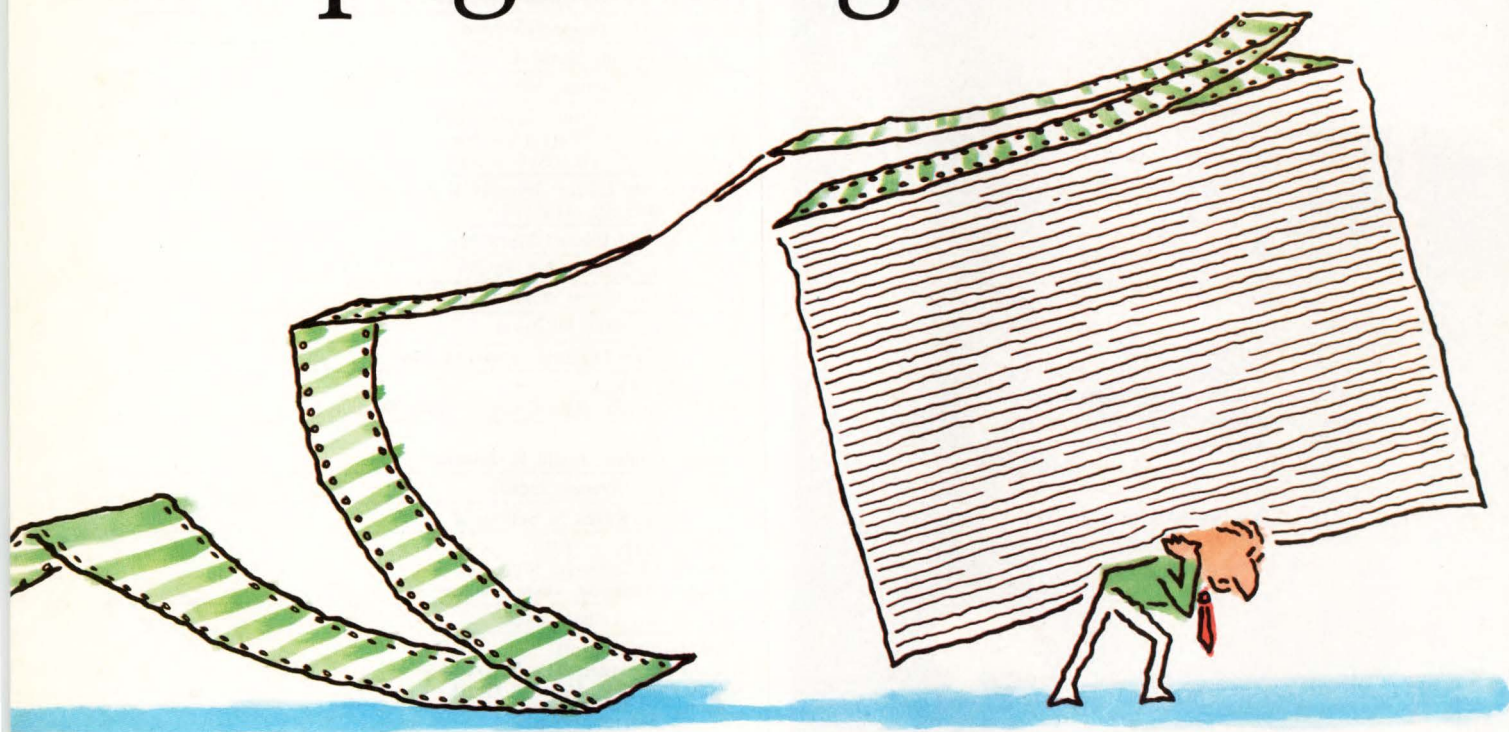
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Headquarters Office

10 Mulholland Dr., Hasbrouck Hts., NJ 07604, (201) 393-6000

Publisher/Vice President: **Don Huber**

Editor: **Mel Mandell**

Executive Editor: **Donne Florence**

Senior Editor: **David Whieldon**

Software Editor: **David J. Kull**

Art Director: **Bonnie Meyer**

Microsystems Editor: **Susan Foster Bryant**

Western Editor: **Martin Lasden**

1307 S. Mary Ave., Sunnyvale, CA 94087 (408) 736-6667

Southwestern Editor: **Jennifer E. Beaver**

585 W. 29th St., San Pedro, CA 90731 (213) 548-7877

New England Editor: **Mary Miles**, (617) 746-4441

Midwestern Editor: **Jan Snyders** (815) 838-5280

Data-Comm Editor: **John Seaman**

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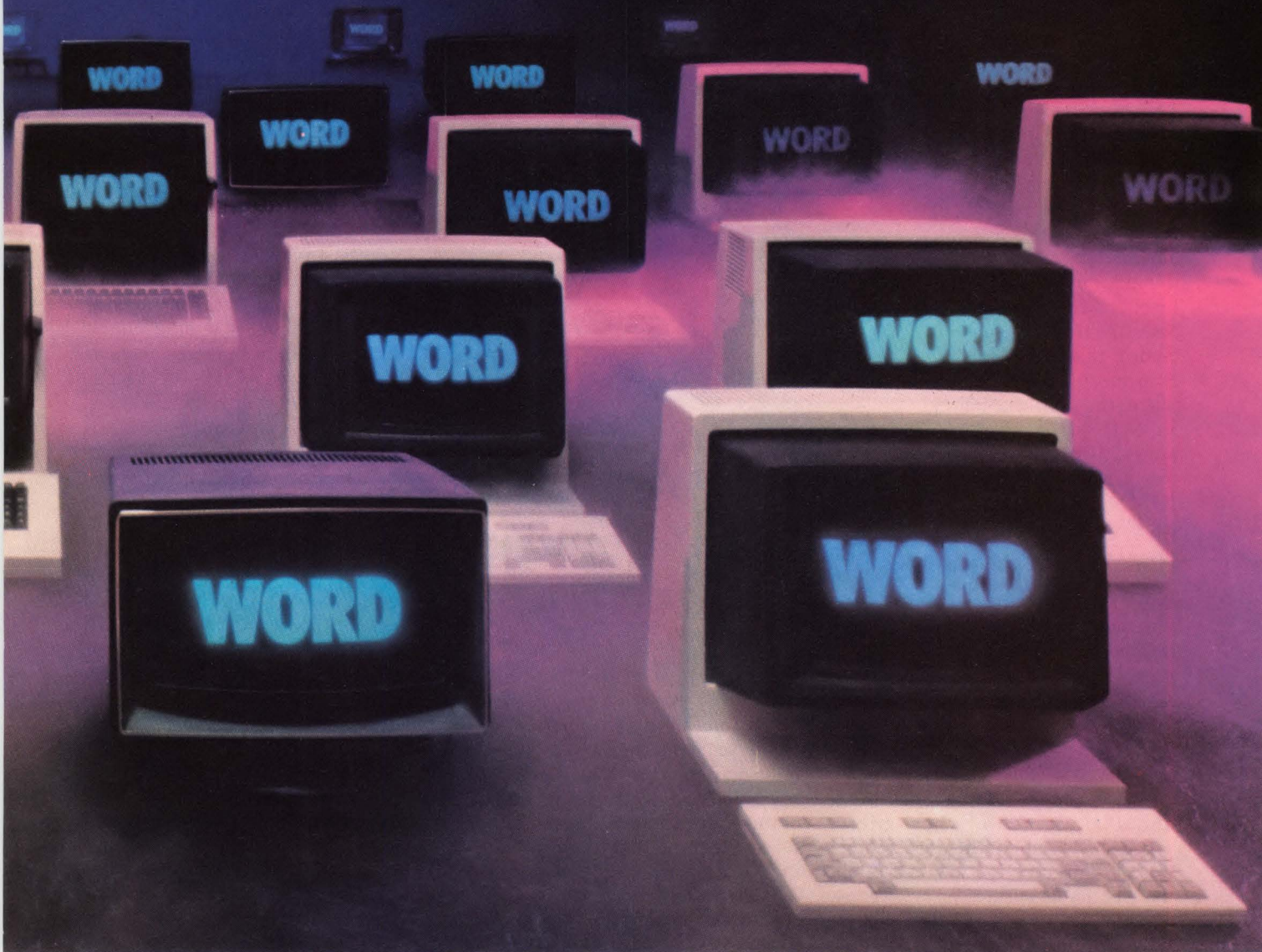
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INSIGHT

A constant in computers

Mainframes are finished!" That was the startling pronouncement delivered by J. Fred Bucy, president of Texas Instruments, during the 1978 National Computer Conference. In a bullish assessment, Bucy concluded that the minicomputer would replace the mainframe as MIS/dp's workhorse. I asked Bucy how he accounted for IBM's considerable backlog in orders for the 3033, then its most powerful mainframe offering. "A temporary phenomenon!" he responded. After the press conference, an embarrassed TI aide told me no one had informed Bucy that his own company had five 3033s on order.

Bucy's prophecy came back to me about a year ago, when microprocessor-based, multi-user systems were taking over the low end of the minicomputer business. They were so successful during 1982 that, for the first time, minicomputer sales grew more slowly (15.3 percent) than those of mainframes (19.8 percent), according to the Gartner Group's "Top 100 in data processing" report for that year. The microsystem business grew fastest of all that year, a trend that continued in 1983.

Last year, according to the latest edition of the Top 100 (see the pullout section in this issue), minicomputer sales continued to increase at a sagging rate (13 percent). Nevertheless, minicomputer sales once again out-



Illustration by Dan Culhane

paced sales of mainframes, and end-of-the-year figures suggest that the minicomputer business is making a big comeback. Thus, although Bucy's obituary for the mainframe was certainly premature, his optimism about minicomputers was justified.

Led by IBM, vendors are concentrating on the high end of the mini business. IBM repositioned its 4300 line of small mainframes as "super-minicomputers," a reclassification that was reinforced with the introduction of the even more powerful 4361 and 4381 machines. (When the 4300 line was introduced, most experts considered the highly cost-effective machines to be small mainframes because they supported System/370 software.)

On other fronts, Digital Equipment Corp.'s VAX line remains popular. Surprisingly, the oldest VAX,

the 780, is selling well, even though a more powerful sibling, the 785, has been announced. Data General has been introducing powerful office and financial software for its largest minicomputer-based systems. The other major mini-makers, such as Hewlett-Packard, Perkin-Elmer, Harris, and Gould, are all pushing out ever-more-powerful processors. To add to the thrust, AT&T Information Systems recently announced the 3B line of minicomputers—and software houses all over the country are making plans to port their products to the

AT&T minis. Tandem Computer, which offers fault-tolerant minis, also continues to grow—albeit fitfully—and Control Data has just introduced a new line of 64-bit minis for engineering and scientific applications.

Despite the growing interest in minis, mainframe sales are healthy and microcomputers continue to boom. This seeming paradox has confounded many prophets who assume that the major computer classifications compete for the same business. Overall, it seems that what's good for mainframe vendors is good for makers of smaller computers and vice versa. The one constant in this business is the demand for more and more processing power—and that buoys sales of micros, minis, super-minis, and mainframes.

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NEWS & COMMENT

More advise than consent on micros

The role of most MIS/dp departments in the acquisition of personal computers and microsystems is to assist and advise, rather than to approve. Of 155 top-level MIS/dp executives responding to a recent survey, slightly more than half said their role is to advise, while 37 percent said it is to review and approve. Nearly one-quarter of the respondents believed their role encompasses both extremes.

The results of the survey by Newton-Evans Research Co., Baltimore, are included in "Microcomputer Usage Trends in Fortune 1,300 Corporations," a report.

Another key finding of the survey was the seeming dissatisfaction of MIS/dp executives with supermicrocomputers, defined as 16- and 32-bit multi-tasking systems support-

ing many terminals. Three out of four respondents said supermicros are unnecessary. More than one-third (36 percent) indicated that they have no supermicros and no plans to purchase them. Only 15 percent said they have supermicros, and 26 percent expected to acquire one or more by the end of next year.

The respondents also downplayed the importance of portable computers. Nearly one-half (48 percent) said they don't envision widespread use of portables in businesses. Eighteen percent said portables would play a major role in corporations, and one-third were unsure. Portables will mostly be used by sales representatives, systems analysts, and professional users who are not managers or clerical workers, according to the respondents. But some executives, managers, and clericals will also use the machines.

Other findings include:

- By the end of 1985, about 420

microcomputers will be installed in the average Fortune 1,300 corporation.

- About 52 percent of these desk-top personal computers will be assigned to professionals. Executives and managers will have about 23 percent and clerical staff members will have the remainder.
- The biggest fear about personal computers in Fortune 1,300 companies is the possibility of security or privacy breaches (cited by 44 percent of the respondents).
- Long-term "supplier viability" is the most powerful influence on microcomputer selection. Others are "connectability" (cited by 47 percent) and "software availability" (33 percent).

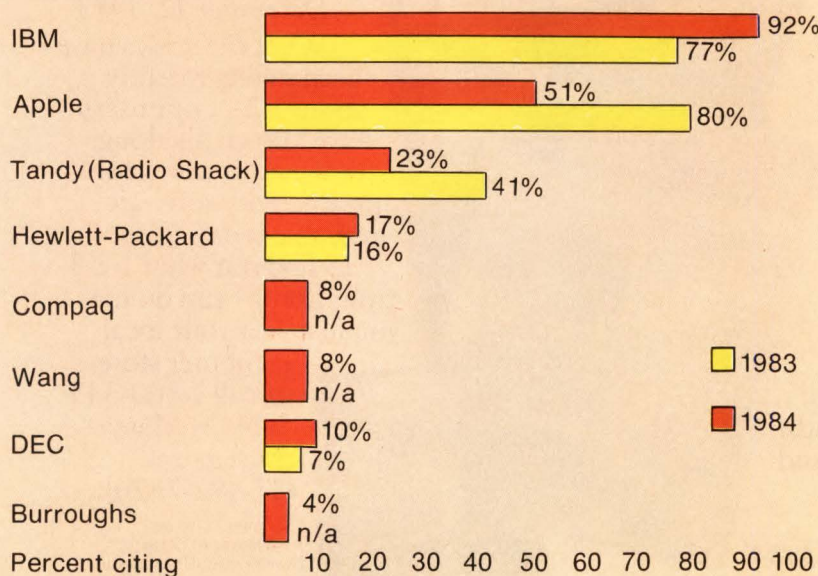
The microcomputer manufacturer represented in the most responding corporations was—you guessed it—IBM. Of 155 respondents, 142 reported owning IBM micros. Two-thirds of the respondents said they had no plans to buy personal computers from other suppliers.

Newton-Evans also asked the respondents about acquisition policies. Twenty-three percent said their organizations don't have an effective personal-computer-acquisition policy.

The most frequently mentioned microcomputer application was spreadsheet analysis, cited by 95 percent of the respondents. Word processing, mentioned by 91 percent, ran a close second. Business graphics was the third most frequently mentioned application. Micro database management systems (DBMSs) are also important to many corporations (60 percent), but more than one-quarter of the respondents said micro DBMSs are unnecessary.

The 250-page report costs \$750. For information, contact Newton-Evans Research Co. at (301) 465-7316. *(News continued on page 16)*

Favorite corporate micros



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WE MAKE THE RIGHT DECISIONS

NEWS & COMMENT

(Continued from page 14)

Remedy for reluctant users: Seed micros

To encourage use of personal computers, Milwaukee County (WI) loans them to employees. If professionals or managers find good uses for the machines, personal computers are included in the appropriate department's budget for the following year.

This "seed" approach prevents a bureaucratic catch-22: If a department doesn't have a micro, employees can't prove they need one and the organization may miss out on valuable advantages.

So far, Milwaukee County has acquired 15 personal computers for loan to departments responsible for county parks, graphic-reproduction services, social services, personnel, and auditing; the sheriff's depart-



Dennis Weedall, budget analyst, uses an Apple III to prepare budget figures for the Milwaukee County Board of Supervisors.

ment; a county hospital; a county museum; and the county administration. Most of these departments have found that personal computers pay for themselves within a year. As success stories get around, enthusiasm among employees has been spreading, according to officials.

Providing seed micros is part of a continuing effort to decentralize the electronic processing of data and documents by county employees. For several years, the backbone of the county's information-processing system was its IBM 3081D mainframe, which is at the heart of a 700-terminal network. The computer is being purchased over a five-year period for \$3 million; software for it costs \$1 million a year. The total an-



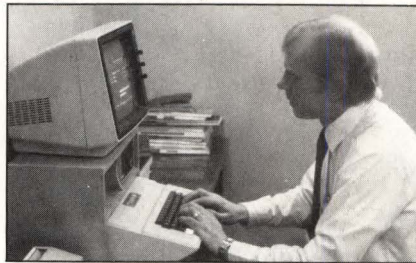
Clerk-typist Jeanette Nichols, working on an Apple IIe, surveys the perpetual inventory of the county's graphic-reproduction department.

nual cost to the county for information processing, including staff time and terminal rental, is about \$10 million.

"We are trying to make the large computer more directly useful to employees through an information center equipped with powerful software packages such as SAS [from SAS Institute, Cary, NC] and APL [from IBM], and various graphics programs," says Michael Corriveau, an executive assistant to the county executive. "The goal is to give users access to the information they need."

Innovative steps like the seed program are helping the county keep up with the rapidly evolving technology of information processing. "Being computer-literate doesn't mean you understand programming," Corriveau says. "The micros have motivated managers to solve some of their problems themselves—to fight their own fires."

To help nurture the developing computer literacy of its workforce,



Working with a micro database management system on an Apple II, Michael Behrens, recruitment and selection administrator, reviews candidates for an opening in the sheriff's department.

Milwaukee County subscribes to two database services for personal-computer users: Dialog Information Services, a subsidiary of Lockheed Corp. (Burbank, CA), and the Local Government Information Network (Login) operated by Minneapolis-based Control Data Corp.

County staffers use the Dialog database to cull to-the-point information on a range of topics from reams of available literature. "In the Information Age, success or failure is partially determined by being able to cut through the tons of available information," says Corriveau.

County employees use the Login network, which takes in more than 100 city and county governments, to learn from the experiences of others. Login has a large database of project summaries, and it puts Milwaukee County staffers in touch with professionals in other communities via electronic mail. For example, a Milwaukee County staffer wanting to know the cost of installing mercury-vapor lights sends a request over the Login system. The system might respond with a summary of the city of Cleveland's experience with the lamps, complete with the name of a contact. The service has cut the number of phone calls from Milwaukee County employees to colleagues around the country.

Milwaukee County's program to distribute data processing hasn't been as easy as a walk on the beach. The county encountered resistance to the program from data-center staffers. "Ten years ago, end users had to genuflect before the mainframe," says Corriveau. "Some of the mainframers still think of micros as glorified Ataris. They don't understand that micros give employees tremendous power and flexibility."

James Cox, county manager of administrative services, says his reservations about micros are more than vague notions about the machines' limitations. Micros are a necessary part of a total dp operation, and the autonomy they give departments

(News continued on page 23)

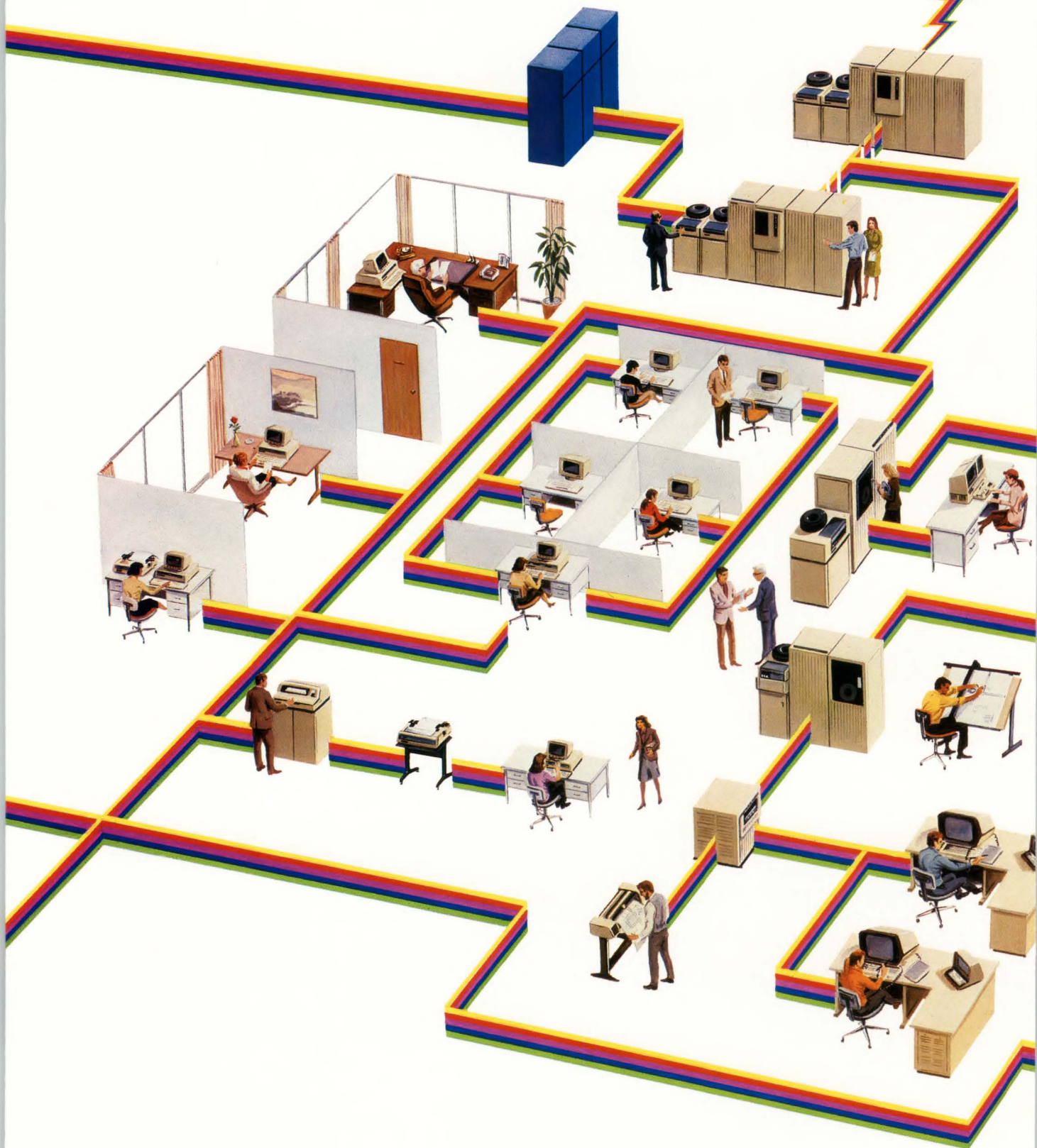
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The Perkin-Elmer solution:
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one system and port it to other EVERYWARE computers anywhere in your organization. For example, you can write software on a desktop micro-computer and run it on a supermini. And because EVERYWARE hardware supports an industry standard operating system, you have access to a vast library of third party software.

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PERKIN-ELMER

NEWS & COMMENT

(Continued from page 16)

helps to reduce the often unrealistic expectations that staff and policy-makers have of central dp, he says. But the county departments are using several different personal computers—Apples, IBM Personal Computers, and Tandy Model 100s—some of which can't speak either to one another or the mainframe. Cox worries that the county's micros aren't being properly coordinated with each other and the mainframe-based network of terminals. "We need network compatibility," he says.

Recently, the Milwaukee County Board of Supervisors moved to begin solving the compatibility conundrum by establishing a data-processing coordinating committee. The goal is to gain a birds-eye perspective on the money being spent for data processing to guide future policy. "Computers are great productivity raisers," says Emil Stanislawski, director of the county administration. "And the county will inevitably spend more money on them. The challenge is to increase creativity and productivity while guarding against unnecessary expenditures."

Corriveau adds: "We don't want a terminal on every desk just to look modern."

Bottom line of VDT-safety laws

The bottom line for management in the debate over the safety of video-display terminals (VDTs) may be legislation that forces it to allocate more money for ergonomic improvements in the workplace.

In statehouses across the nation, bills are being introduced advocating better working conditions for VDT operators. According to Mark Pinsky, editor of *VDT News*, a New York-based publication that has been following these legislative efforts, bills are pending in California, Connecticut, Illinois, Maine, Massachusetts, New York, Ohio, and Rhode Island.

Managers in those states won't have to cope with new mandates in the near future. All of the bills requiring employers to eliminate alleged safety problems are at early stages of the legislative process. Most are still in committee or have been sent to committee hearings. Barring unexpected developments, no action is expected on them within at least the next few months.

VDT News also reports that legislators in Hawaii, Iowa, Minnesota, New Mexico, Oregon, Washington, and Wisconsin are preparing VDT bills. The provisions of each bill vary from state to state, but they have much in common. Most have provisions obligating employers to:

- Regularly inspect VDTs for radiation emission and promptly repair malfunctioning machines.
- Give pregnant employees assignments away from VDTs without loss of pay, seniority, or benefits.
- Allow frequent rest breaks for VDT operators.
- Pay for employee eye examinations.
- Install ergonomic workstations.
- Set up advisory committees to study the effects of VDTs on workers' health.

Some of the bills also prohibit automatic monitoring of employees using VDTs.

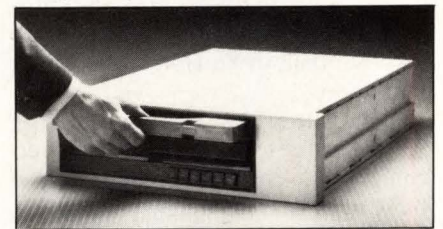
The changes mandated in these bills could be costly for employers. For example, one of the stricter bills limits the amount of time an employee can spend in front of a VDT each day to four hours. Such restrictions pose obvious scheduling problems for employers.

The Computer Business and Equipment Manufacturers Association (CBEMA) brands the VDT-safety bills as counterproductive and threatening to labor-management relations. "The charges about VDT safety are not supported by scientific evidence," says Bill Hanrahan, a CBEMA spokesman. "There's no proof that VDTs are a radiation hazard to employees."

Advocates of the legislation believe

more research must be done before VDTs can be declared safe. "The questions regarding VDTs still remain," says Frank Prosnitz, administrator of the Providence Newspaper Guild, a union that supports VDT legislation in Rhode Island. "No bill would take away the machines. We're asking companies to provide the proper work environment. Headaches, eye problems, and backaches all can be alleviated with proper lighting and seating. When a company corrects ergonomic conditions, labor and management both benefit. It's common sense—productivity has got to go up."

Big-byte disks



By year's end, billion-byte optical-disk drives like this one may be available from systems suppliers. Optical Storage International, a joint venture of Control Data Corp. (Minneapolis) and N.V. Philips (The Netherlands), has this drive in beta tests. The glass-encased media is nonerasable, but OSI and others are working on erasable systems.

Portables list grows

Add two new machines to the growing roster of portable personal computers. Apple Computer Inc. recently introduced a portable version of its popular IIe machine and STM Electronics Inc., a Canadian outfit, introduced a portable that's compatible with the IBM Personal Computer.

Many observers consider the \$1,295 Apple IIc, which weighs only 7½ pounds, to be primarily a home computer. Obviously, Apple hopes

news & comment



The new Apple IIc.

that the many businesses that now use the new machine's older sibling will find productive applications for the portable. The company claims more than 90 percent of the roughly 10,000 programs that run on the Apple II line will run on the new machine. To run most of those programs, however, you'll have to buy an external disk drive (for \$329) and a monitor.

The Canadian IBM clone, the STM Portable Personal Computer, comes with a speaker phone and a built-in printer. It weighs 17 pounds, which is little more than half as much



The new STM Portable Personal Computer.

as IBM's own portable version of the PC, the Portable PC. STM reduced the weight of its machine by substituting a liquid-crystal display for the bulky cathode-ray tubes included on heavier portables.

The portable's speaker phone is designed to let a user to carry on a telephone conversation while working at the computer. At a recent demonstration, however, the vendor had problems getting device to work.

The new STM portable, which

costs \$3,449, is also available in a desk-top version for \$2,995. For more information on the new STM portable call Semi-Tech Microelectronics, the marketing arm of STM, at (415) 981-4020. Apple Computer can be reached at (408) 996-1010.

Train thyself before others

Bombarded by end-user queries on how to operate and apply personal computers? To answer these and other user questions effectively, MIS must train itself. Only then can it successfully tackle the challenges of educating end users.

That was one of the conclusions reached by 35 data-processing and human-resources professionals at a two-day seminar in Newport Beach, CA. The conference was conducted by the Diebold Group, a New York-based management consultancy. No hard-and-fast rules emerged, but attendees found new directions to guide MIS through the relatively uncharted waters of acquainting non-technical users with technology.

The stakes are high for MIS, according to the participants. Without controlling training, MIS can't hope to retain control of information processing within an organization, they concluded. "MIS must develop a missionary role because it is the source of technology," said Doug Tayler, vice president of product development for Deltak, a supplier of multimedia and computer-based training in Naperville, IL. The image is benign, but its goal is to retain control. In the role of missionary, MIS can guide users and management in the selection of personal computers and their applications.

Coming to grips with this leadership role can be tough for MIS professionals accustomed to quietly working in the background. To generate enthusiasm within MIS, Patrick Nelis, a Diebold associate, suggested assigning responsibility

for certain projects and products to individuals. This not only takes some of the pressure off the MIS director, but also nurtures personal interest and pride among staff members.

In addition to its missionary robes, MIS must also don a salesman's hat. "You're really selling training to the end user," explained Tayler. "Grab a user's interest when it's expressed, and let him or her plink away at a computer."

Preparing MIS for the end-user challenge requires both management support and money. Allen N. Smith, manager of corporate-information services at the Los Angeles-based Atlantic Richfield Co., designed a training program to acquaint the petroleum producer's 1,000 systems engineers with personal-computing technology and what it could do for the company. Despite his rather intangible goal of encouraging innovative and strategic thought, Smith was given a \$1 million budget and the blessings of top management.

Smith acknowledged that the success of the program is impossible to measure. "You either believe in education or you don't," he said. "What's one good idea worth? If, as a result of the program, one attendee comes up with a \$1 million idea, it will have paid for the whole project."

Morgan Stanley & Co., a Wall Street investment-banking firm, takes a more aggressive and somewhat cavalier approach to MIS training. Morgan Stanley trains top liberal-arts graduates as programmers and stock brokers. This dual expertise helps bridge the gap between MIS and nontechnical users, said Terry H. Ebert, director of the program. "It makes the systems professional seem a little less weird," he explained. "Now the users come to us for help."

Heaven help MIS pros who fail to keep pace with this aggressive operation. "Our motto is up or out," said Ebert. If promotions don't come at a good clip, an employee is asked to leave—like many of the old MIS

(News continued on page 28)

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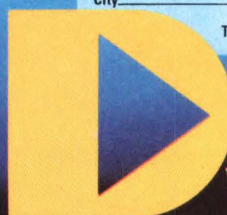
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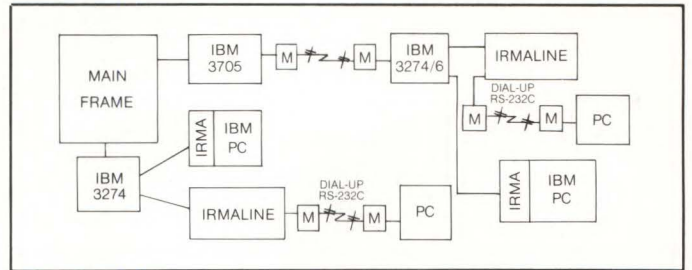


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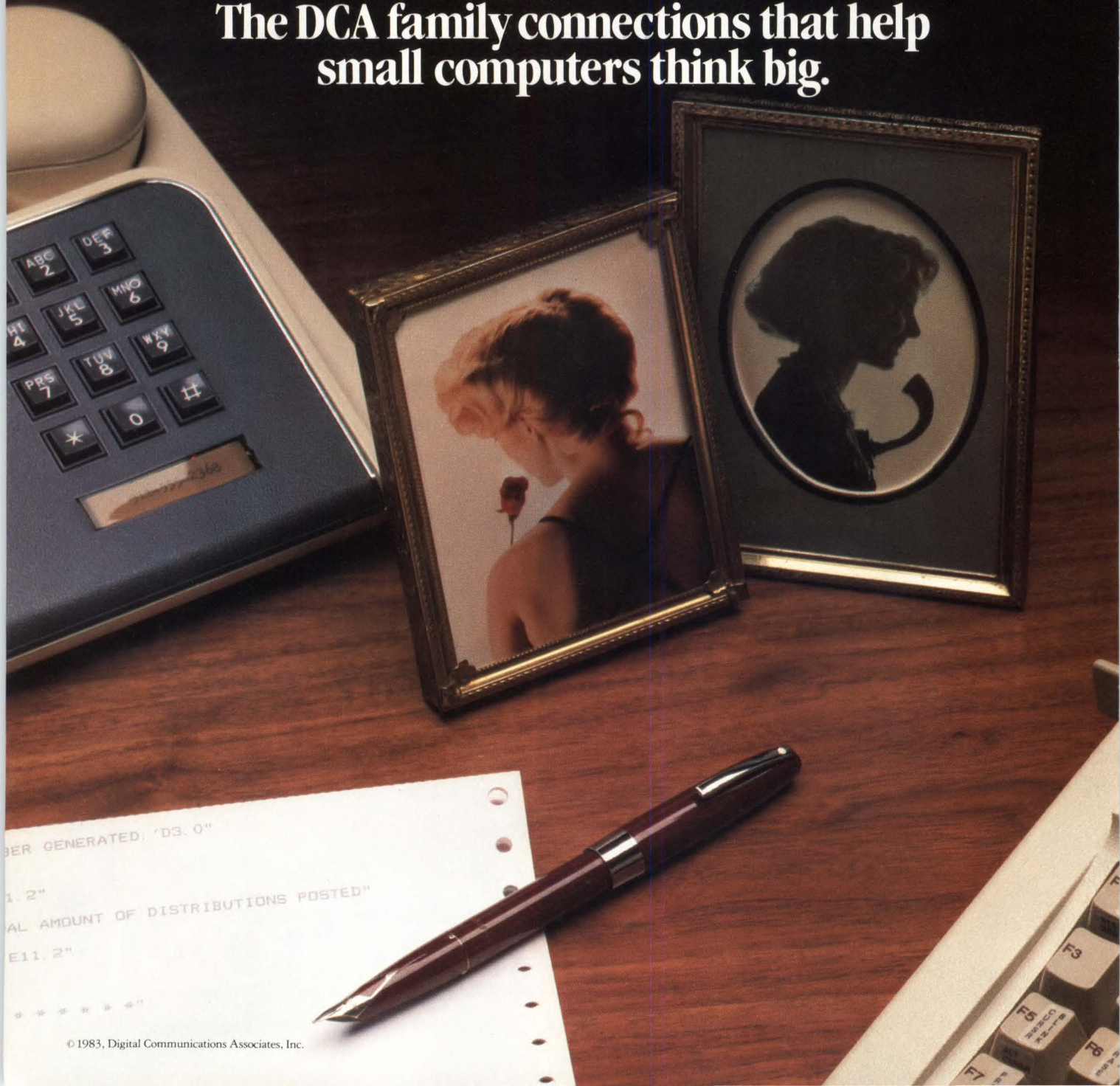
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NEWS & COMMENT

(Continued from page 24)

guard were asked to leave when the training program was initiated.

A radical training program like Morgan Stanley's only works in a fiercely competitive company. But despite the difference in approaches, it does have something in common with the Atlantic Richfield program. Both are designed to help employees identify with the company and reduce the turnover rate. Said Ebert: "Machines are cheap; people are expensive. When our people are asked what they do, they don't say, 'I'm a programmer.' They say, 'I work for Morgan Stanley.'"

Once you've accepted the fact that MIS needs training to effectively impart technology to the corporate masses, where does the money come from to implement it? Only 1 percent to 1.5 percent of the MIS budgets of the organizations represented at the seminar are set aside for education. A far-reaching program will usually

Rainbow of disks offered

On the theory that easier diskette filing is a many-colored thing, a California company is marketing a line of 5¼-inch blank diskettes in casings of six different hues. Allenbach Industries Inc., Carlsbad, CA, offers its Kaleidiskettes in red, green, yellow, orange, powder blue, and royal blue. A 10-pack of single-sided floppies costs \$40. A 10-pack of double-sided diskettes costs \$50. For information, call Allenbach at (619) 438-2258.

require help from outside the department. That aid may come from an unexpected source—the executive level, according to Diebold's Nelis. "Presidents and CEOs have seen the man in the little bowler hat on television [IBM's Chaplinesque character]; their kids probably play games on personal computers. These executives may realize the need for training, but aren't sure how to get the ball rolling."

Don't wait too long to adopt your missionary role and lead employees out of the wilderness. "Stop worrying about the four-year backlog of appli-

cations. It will never go away," counsels Deltak's Tayler. "Concentrate on training. If you don't get it done, the competition will."

The real cost of E-mail services

A survey of 13 electronic-mail service bureaus reveals a wide divergence in costs. Use of one system could cost up to 250 percent more on another service. Because of the different pricing policies,

(News continued on page 34)

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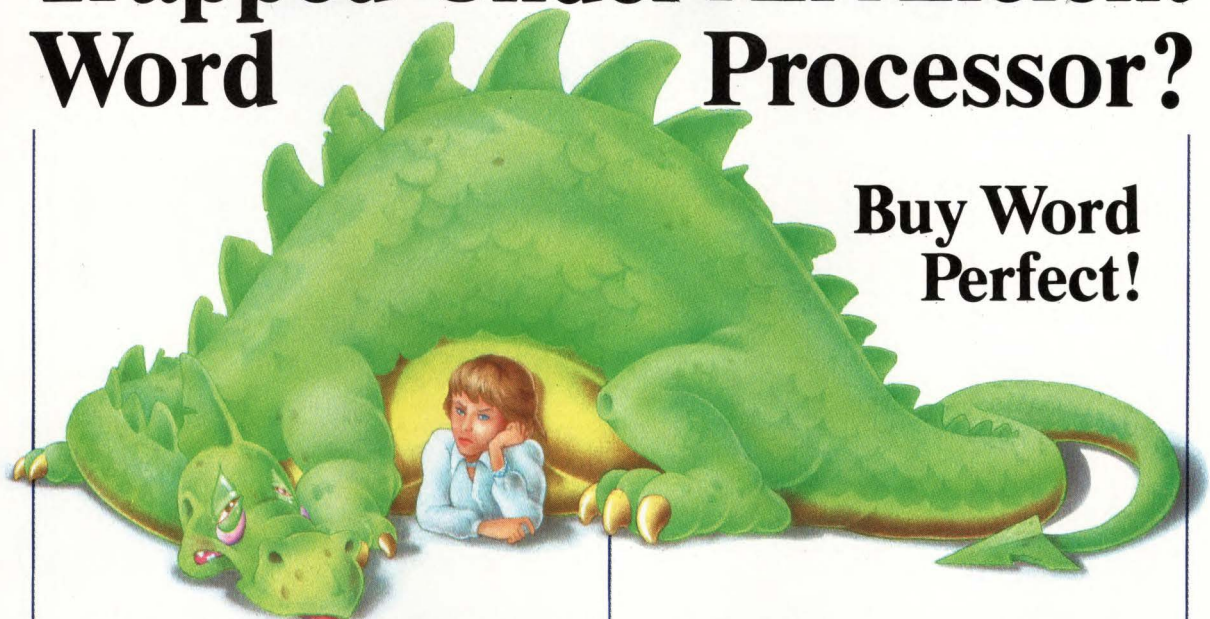
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CIRCLE 13

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Once upon a time, word processors were monstrous things. Dot commands, page orientation, and separate editing, formatting and printing programs turned them into lumbering beasts. Only a well-educated programmer would dare don his armor and tackle such a beast — not a pleasant task for a modern secretary, executive, or writer.

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not only for the features
we've built in, but
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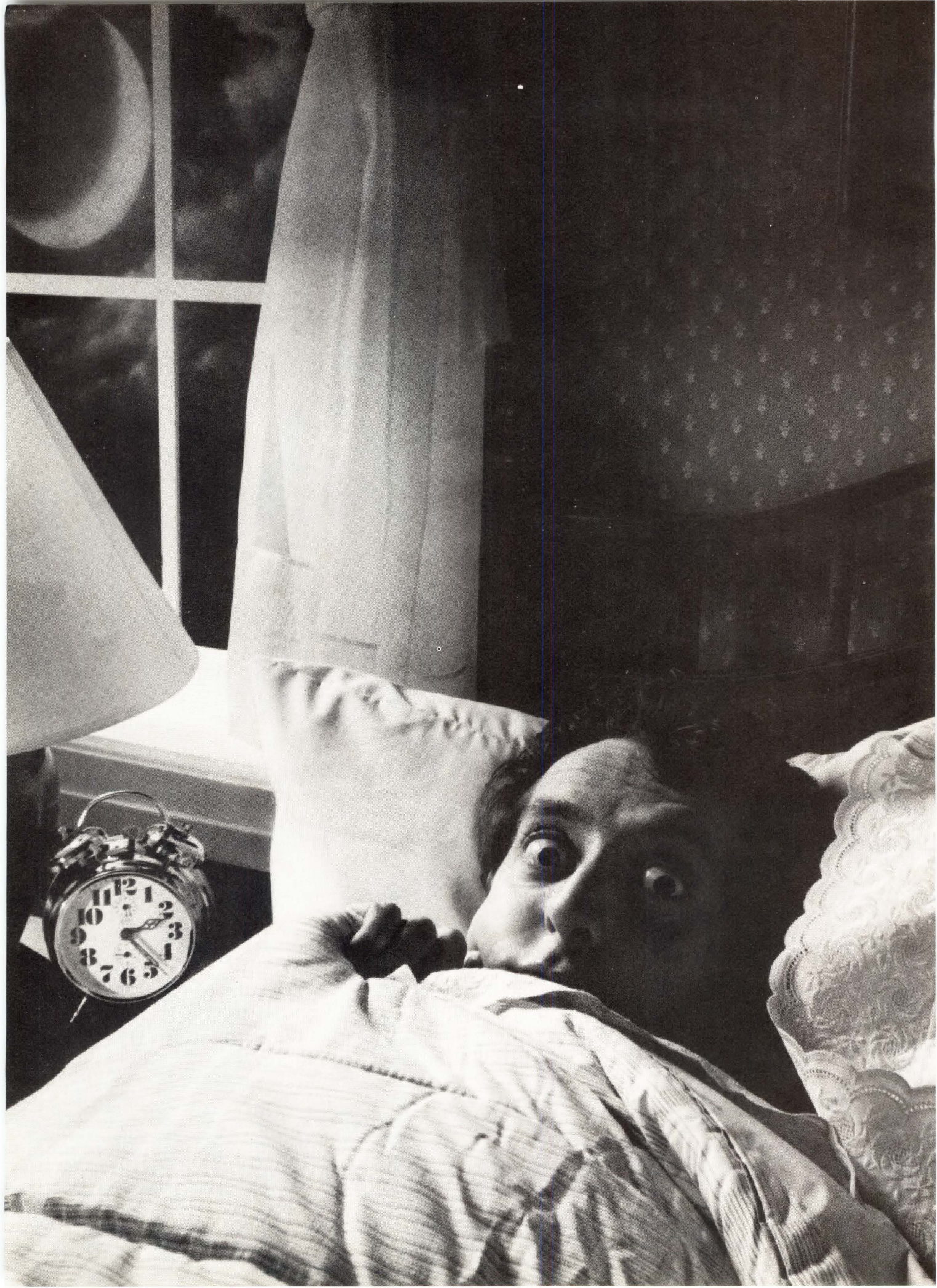


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CIRCLE 75



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And you can build a B25 network just by adding workstations. It's the only network designed to share data simultaneously. So entire departments can plug into the same data bank.

Needless to say, the B25 is backed by Burroughs' worldwide service and support. Plus, its self-diagnostic software can actually show you where a problem is occurring. So most of the time, fixes can be made quickly by disconnecting one module and simply snapping on another.

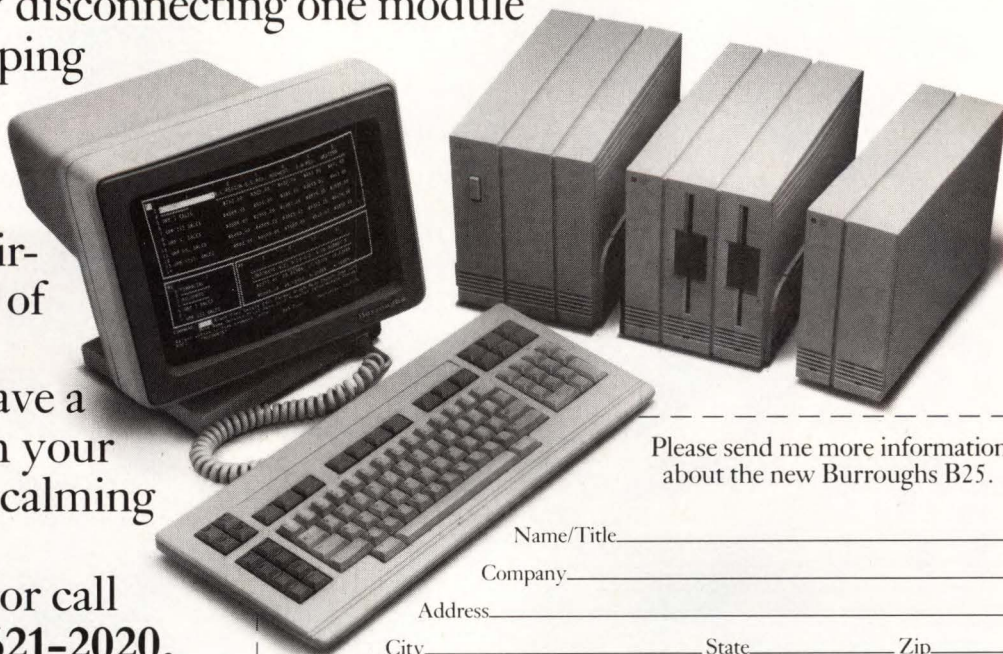
The new Burroughs B25 has eliminated virtually every fear of obsolescence. Which should have a positive effect on your business. And a calming effect on you.

Mail coupon or call toll free: 1-800-621-2020.

Burroughs

THE QUESTION ISN'T WHO'S BIGGER.
IT'S WHO'S BETTER.

CIRCLE 12



Please send me more information ^{CD-6}
about the new Burroughs B25.

Name/Title _____

Company _____

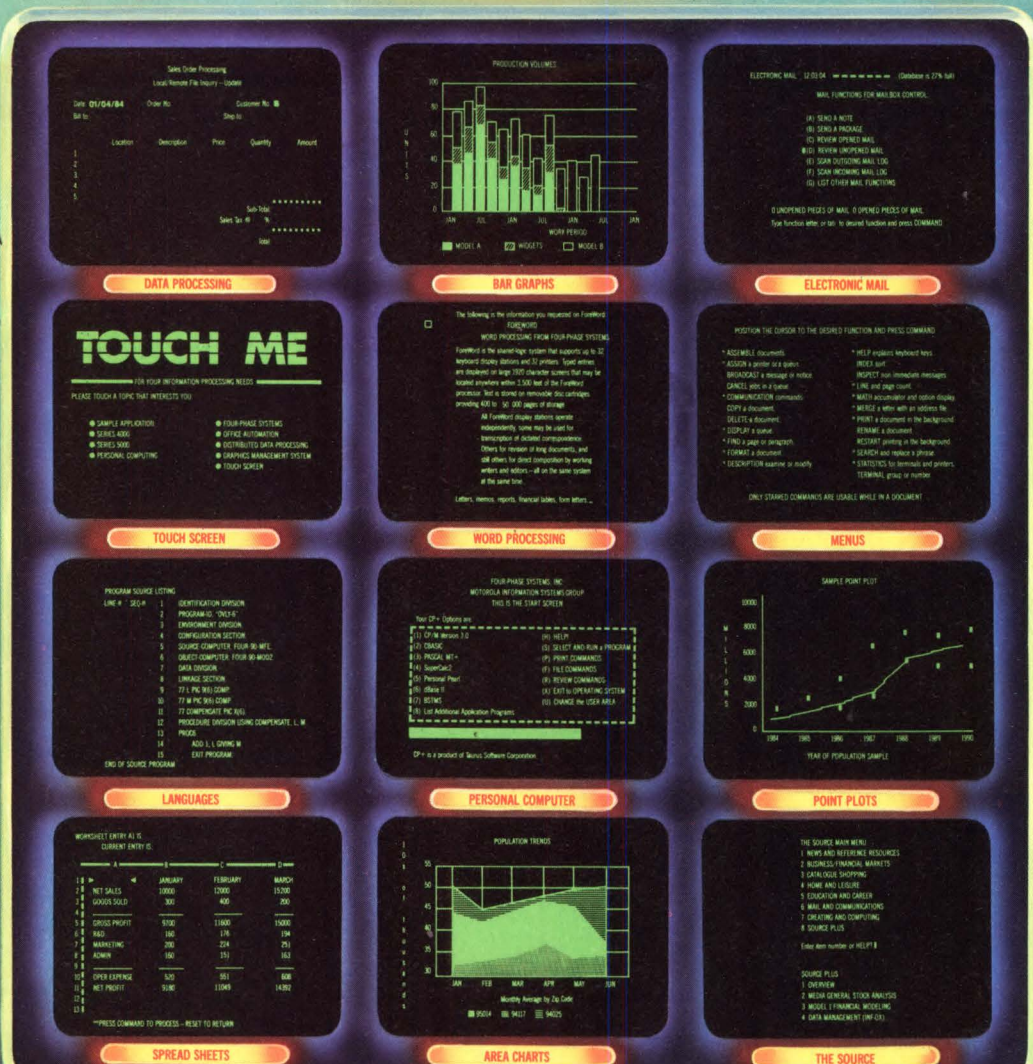
Address _____

City _____ State _____ Zip _____

Telephone _____

Send to: Burroughs Corporation, Dept. B25,
P.O. Box 10934, Chicago, Ill. 60610

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Four-Phase is helping more than 2,000 DP managers win the productivity game.

Now it's your turn.

It's easy to win the distributed information processing game when you play it with the Series 4000 from Four-Phase. The Series 4000 is an integrated, growth-oriented system designed to communicate within your IBM environment. No other vendor gives you so many functions for so many years at such affordable prices. In the distributed processing arena, that's the way to score points with both end-users and top management.

You win the DDP game with software.

Four-Phase provides one of the most impressive and complete collections of software ever offered from one company. Our packages make integrating Four-Phase computers remarkably easy. And guarantee a logical growth path for years to come. Here's just a sample of what we provide:

Interactive processing: VISION®—For creating custom applications from order entry to transaction processing. It provides a high level of functionality that can be used in any distributed environment. And VISION is easier and faster to program than COBOL.

Word processing: FOREWORD®—Our powerful shared-logic word processing system allows text to be entered, stored, edited, distributed and printed.

Graphics—For business graphics, the Graphics Management System (GMS/IV) gives you an easy way to condense and conceptually present data that's easily understood by decision makers.

COBOL—Industry standard COBOL is used to write programs for handling keyboard-entered data and general batch processing.

When they want PC's, you've got them!

If your end-users are like most these days, they're clamoring for their own personal computers. We play that



The action starts with the Multifunction Executive.

The key to the Series 4000 game plan is the Four-Phase Multifunction Executive (MFE). This unique and powerful control program monitors each multifunction terminal in your system. Its ability to run multiple software programs allows your users to perform 16 different tasks from any terminal on the system. And each of your users can access all of our software packages with one keystroke. You get maximum distributed processing capability and control.

Plus, MFE dynamically allocates selected peripherals so that each device can be used by more than one program. The result—MFE eliminates the need for multiple processors, duplicate terminals and other peripheral devices at installations that require concurrent execution of software.

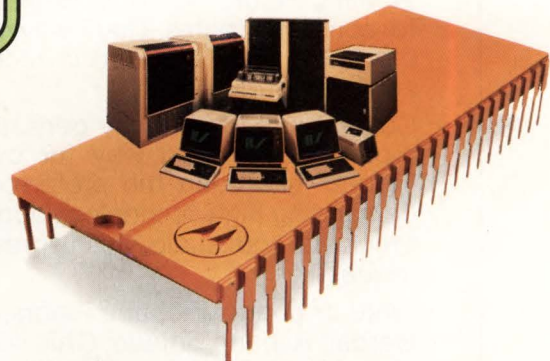
game, too. Because at the flick of a switch, our multifunction terminals suddenly become stand-alone PC's. So now you can give your users the distributed processing capabilities they need, AND the personal computers they want. All in one integrated system.

2,000 winners can't be wrong!

Four-Phase was the first company to introduce the integrated approach to multifunction distributed processing. Today, there are more than 15,000 installed Series 4000 systems, helping people like you manage the information needs of over 150,000 end-users. And every machine is backed by our Customer Support Operation and over 1,000 field service people to provide continuing support and reliability at every level.

Four-Phase customers have been winning the DDP game for years. You can, too. To find out how, call us today at 1-800-528-6050, ext. 1599. In Arizona, call 1-800-352-0458, ext. 1599. For a free poster of this illustration, write to us at 10700 North De Anza Blvd., M/S 52-6A9, Dept. P., Cupertino, CA 95014.

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MOTOROLA
Four-Phase Systems

NEWS & COMMENT

(Continued from page 28)

users can easily be confused about what they're being charged for, concludes *Electronic Mail and Micro Systems (EMMS)*, a newsletter published in Norwalk, CT.

Some electronic-mail services

charge for online time, others by the number of characters transmitted, and others by the number of commands used, the newsletter reports. Many vendors base their prices on a combination of these factors. Others

charge monthly subscription fees and bill customers for added storage.

To sort out the tangle of billing methods to find the lowest-cost service, *EMMS* developed a formula based on average-usage statistics provided by various vendors and each vendor's monthly tariff. The EOS service from CNCP (Toronto, Ontario, Canada) came out on top with a charge of \$55.80 per month. On Tyme from Tymshare of Cupertino, CA, ran a close second at \$59.43. The next three finishers were Dialcom from ITT (Silver Spring, MD), \$68.57; Telemail from GTE (Vienna, VA), \$70.10; and MCI Mail from MCI Digital Information Services (Washington), \$74. The last-place finishers were Infoplex from CompuServe (Columbus, OH), which registered a monthly charge of \$138.33, and Easylink from Western Union (Upper Saddle River, NJ), averaging \$139.70 a month.

EMMS cautions users not to choose an electronic-mail service on the basis of cost alone. For example, despite its relatively high comparative cost, Easylink should not be written off, says Steven Weissman, assistant publisher. "Easylink offers easy connections into the telex network that you don't get with many services," Weissman says. Tymshare also offers this feature, and CNCP's EOS will be offering it in the near future.

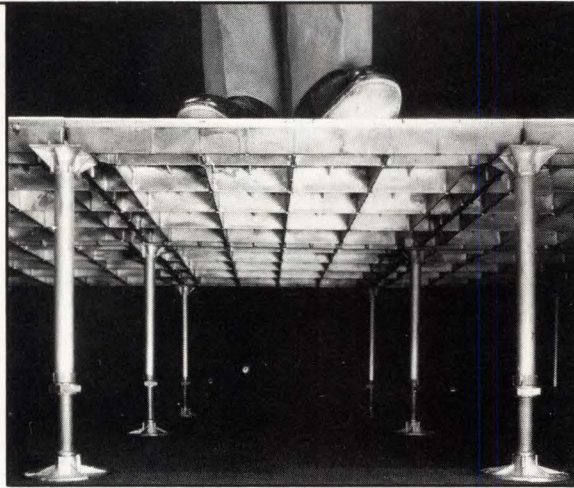
A free copy of the survey can be obtained by calling (203) 866-6914.

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Write or phone: Floating Floors, Inc., Department 112, 795 Berdan Avenue, Toledo, Ohio 43610, P.O. Box 6627, Toledo, Ohio 43612-9627, Tel: (419) 476-8772 TLX II: 810-442-1719.

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A free Unix look-alike?

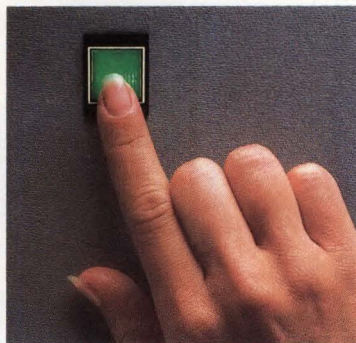
Richard Stallman, a former standout at Massachusetts Institute of Technology's Artificial Intelligence Laboratory (Cambridge), has a strong distaste for proprietary software. Matching his programming talents to his opinion, Stallman is developing—and plans to give away—an operating system compatible with Bell Labs' Unix. Stallman hasn't found a backer

Forget all the dirty stories you've ever heard about in-house COM printing.

Today's COM from Bell & Howell is a whole different story. Our 6650 is a compact, dry system that's totally self-contained. There's no laboratory, no chemicals, no water. Nothing!

What's more, with most COM systems, you have to hire expensive technicians. And put up with frustrating operating procedures that often cause delays.

But not with the 6650. It was designed specifically for DP environments.



1. To load the 6650, simply insert the film. There are no messy chemicals.
2. When you're ready to print, it's easy. Just press a button.
3. Your fiche will be ready in seconds—for a fraction of what it would cost to put the same data on paper.

It's as easy to operate as most line printers. So your staff can use it with minimal training. And because it operates on-line, it can produce your data in real time. All you have to do is enter a few simple English language commands. The 6650's software will take over from there. It can handle microfiche production. Create and maintain job setups. And even produce audit trails. All at the same time.

Meanwhile, you won't have to interfere with your host computer's software because the 6650 has its own minicomputer and emulates an IBM® 3211 printer.

And here's another surprise: Your end users will appreciate the sharp, clean images from the 6650's dry process.

Isn't it time you learned more about Bell & Howell's clean new approach to COM? Call our marketing manager toll-free at (800) 538-4000. In California, call collect, (714) 660-1050. In Canada, (416) 746-2200.



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COM DIVISION

NEWS & COMMENT

to manufacture and distribute his product, called Gnu, but he's plowing ahead anyway.

Stallman outlined his plan at the IEEE Computer Society's annual conference on software engineering. The economy will receive the greatest gain from software-development projects if the resulting packages are given to anyone who needs them, he says.

Can original projects be financed without the promise of rewards from the sale or licensing of software? Yes, says Stallman. The government, hardware manufacturers (which stand to profit from programs that make their machines more useful), and user groups will replace the promise of profits as chief motivator for software designers. "The really talented programmers will work regardless of the financial rewards," Stallman says.

Much of Stallman's concept of software ownership grew from his experience at MIT, where he helped develop the Lisp artificial-intelligence machine. Until recently, the sharing of software and information was the rule in AI research, he claims. But the emergence of commercial ventures to capitalize on AI discoveries changed that principle, and the change will hamper future development. Stallman, who has left MIT, is clinging to the old ways. He won't even use software that must be purchased. He supports himself by teaching and consulting.

Meanwhile, Stallman works on his Unix look-alike in his Cambridge apartment. He receives some help from other programmers who, he says, either share his views or simply enjoy the challenge. Stallman describes the Gnu operating system as being "as compatible with the various versions of Unix as they are with each other." He chose to focus on this type of operating system, he says, because the free availability of its development capabilities will make the protection of much software "largely irrelevant." He expects Gnu to be ready for release within a year.

Electronic recruiter

A new dialup recruitment service that promises to deliver the electronic resumes of 4,600 data-processing and engineering professionals is available from

Computer Assisted Recruitment International Inc. (CARI) of Schaumburg, IL. CARI charges fees for the service based on online time. Professionals looking for a change of corporate scenery can have their res-

SUPPORT SYSTEMS

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you win.



CIRCLE 17



Liebert

World leader in computer support systems

umes added to CARI's database at no cost.

CARI is available via the GE Information Services network. Managers can access the list of resumes via personal computers equipped with

modems and communications software. The system includes help menus that ask employers for profiles of new recruits, including job description, experience, education, and other criteria. CARI's database matches

the criteria to the attributes of candidates.

Each time a corporation uses CARI, online time is credited against an initial \$5,000 fee. A typical search of six candidates costs about \$200. After the \$5,000 account is depleted, the user is pre-billed for another \$5,000 worth of time.

CARI claims its database includes resumes from systems analysts, programmers, and even MIS/dp managers, earning between \$20,000 and \$70,000 a year. As of early May, CARI's listing included 1,676 data-processing professionals and 2,993 engineering pros. For information on how to use the service for recruiting, call (312) 490-7140. Professionals seeking to have their resumes listed by CARI should call (312) 343-4995.

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CD64

IBM to hit \$160 billion by 1993

Big Blue should gross \$160 billion—four times its 1983 revenue total—by 1993.” This prediction by F.G. “Buck” Rodgers, IBM's vice president of marketing, was one of the highlights of the annual Million Dollar Awards program sponsored by International Computer Programs Inc., Indianapolis.

However large \$160 billion seems, it would still leave IBM with a declining share of the computer business, says Rodgers. He believes the international market for data-processing equipment and services will approach \$2 trillion in 10 years.

The ICP's awards for marketing achievement in software went to Lotus Development Corp., Cambridge, MA, for selling \$53 million worth of Lotus 1-2-3 in its first year. Four products from independent software houses reached the \$100 million level last year. They are: CA-Dynam from Computer Associates International Inc. (Jericho, NY), The MSA General Ledger System from Management Science America (Atlanta),

NEWS & COMMENT

Ramis II from Mathematica Products Group (Princeton, NJ), and Easytrieve from Pansophic Systems Inc. (Oak Brook, IL).

Awards for these achievements were eclipsed by Cincom Systems Inc., Cincinnati, which passed the \$250 million mark for its Total database management system in 1982.

IBM makes PC better for offices

Big Blue is endeavoring to make the Personal Computer a better tool for the office by adapting the programs that run the Displaywriter dedicated word processor for it. In addition, a letter-quality printer with sheet-and-envelope feeder for the Displaywriter is being offered for the PC.

The new Displaywrite packages for the PC come in three flavors. Displaywrite 2, which includes a 100,000-word spelling verifier, costs \$299. A variation for lawyers costs \$165. Displaywrite 1, for the PCjr, costs \$95. An interface that permits the Displaywriter to be connected to a PC costs \$495. The new printer for

the PC costs \$6,030—more than a new PC. A special cable and printer-driver program (\$220) are required to use a PC with the Displaywriter printer. A \$625 printer-sharing device lets up to four PCs use the same printer.

IBM is also offering Displaycomm BSC, a synchronous communications program that lets PCs communicate with one another. The package costs \$375.

IBM has also introduced a kit that lets the PC support the 5520 administrative system, a further enhancement of the machine's utility in the office. The kit costs \$1,113. In addition, file-transfer programs that link PCs to System/36 or /38 minis have been announced. IBM also plans to connect the PC and 3270 PC (a version designed to be linked to IBM mainframes) via Document Interchange Architecture to the Distributed Office System (DISOSS), which runs on IBM 4300 superminicomputers and System/370 mainframes.

Big Blue isn't planning to replace the Displaywriter with the PC. According to a company statement, sales of the former remain strong and are not expected to decline because of competition from the PC. Indeed, one of the big questions about the PC's future in the office is how easily employees can switch from the Displaywriter's big keyboard to the PC's smaller, simpler one. IBM maintains that the transition takes two hours.

In addition to the new offerings for the PC, IBM has also announced a new, smaller version of the System/36, which costs \$13,000. The new processor, designed for offices, can be plugged into an ordinary two-prong wall outlet and support up to 86 terminals. With a little modification, software written for the older S/34 can run on the new machine, yet it offers 30 to 40 percent more power for the same cost.

IBM also introduced new software that makes the PC a videotex terminal, and a color display for the PCjr.

Computer rentals to the rescue

Office micro on the blink? Companies that depend on personal computers can't afford even a little bit of downtime. What happens when the inevitable breakdowns occur? Why not call a computer-rental service to keep your business humming?

Services rent up-to-date personal computers for a day, a week, or a month, and most offer immediate delivery. In many cases, all or part of your rental payments can be applied toward the purchase of machines.

Rentals offer other advantages. By renting a personal computer, you can test its mettle before buying it. You can also evaluate your organization's needs for micros and get a better handle on how personal computers fit in—before you commit cold cash to hardware. "For a company that is not ready to make a commitment to the technology for fear of getting stuck with an obsolete machine, renting is a good way to go," says Gary Buttner, a spokesman for General Electric Corp.'s rental division.

GE (Fairfield, CT) operates one of the largest computer-rental services. Its Instrumentation and Computer Service department, based in Schenectady, NY, offers the IBM Personal Computer, the Apple II, IIe, and III models; and Hewlett-Packard's HP 85 and HP 86 to businesses anywhere in the country. GE has 20 sales locations in major metropolitan areas, and requests for equipment can be honored the same day. Although no major training is provided upon delivery, GE provides all of the original manufacturer's documentation and handles installation. Pricing is handled on a per-unit basis. For more information call (518) 385-2195. Here are four of the available package deals.

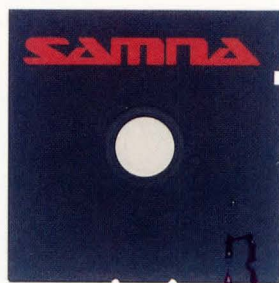
- "The VIP"—hardware comprises an IBM 5150 personal computer, a color monitor, a dot-matrix printer, and MBA software from Context

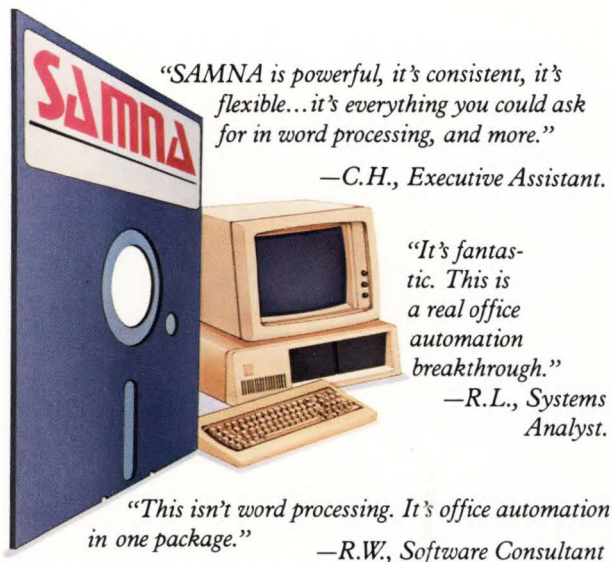
(News continued on page 47)



The new compact version of the IBM System/36 was designed for offices.

**On April 17, ten eyewitnesses
watched in shock as this
harmless-looking diskette
committed murder.**





"With SAMNA's features, I can do better word processing, faster."
—J.B., Word Processing Secretary.

SAMNA flat out murdered them.

They were mightily impressed with SAMNA's powerful word processing capabilities. Its screen-to-page fidelity, with on-screen display of boldfacing, underscoring, centering, and left- and right-justification. Its split screen editing, that lets you display—and even edit—two documents simultaneously. Its automatic pagination and footnoting. Its automatic search and replacement of a word, name, or phrase anywhere in a document. Its glossary of standard paragraphs (so useful in creating contracts and legal documents). And the consummate ease with which SAMNA performs additions, deletions, and text movement.

They had never seen a word processor that could scroll horizontally almost without limits, then electronically fold the document so you can compare left and right margins side by side. SAMNA can, with its unique Electronic Fold feature.

SAMNA can also Zoom, letting you reduce a large or wide page down until it can be viewed on the screen

in its entirety.

10 Office Automation professionals compared SAMNA software against their Wangs and NBI's. And all 10 chose SAMNA.

Most Office Automation people would tell you that none of the word processing software for PC's can do the job as well as a dedicated word processor. But the people who tested SAMNA know better now.

On April 17, 1984, we asked a group of Office Automation supervisors, secretaries, and analysts to compare SAMNA Office Automation software to the dedicated word processors they've used the most.

The results were shocking.

All 10 of these OA professionals were convinced that SAMNA far surpassed their stand-alones in terms of pure power, functionality, and user interface. In fact, they felt that



Wide page? SAMNA "folds" it to compare left and right margins side by side.

**But it may be the most constructive force
you can add to your business.**

**Introducing SAMNA
Office Automation Software for PC's*
It outperforms dedicated word processors,
seamlessly integrates spreadsheets,
list management, and line drawing,
and anticipates your next move.**

*SAMNA is available for IBM PC, XT, IBM-compatible, TI Professional, and DEC Rainbow microcomputers.



It wrecked a Wang.

It crushed an NBI.





Build a bar chart or draw up a table of organization with SAMNA's line drawing.

Now, about those integrated functions. The five-function math is a built-in calculator. You can use it anywhere, without having to stop and set up rows and columns. The line drawing lets you construct your own charts, graphs, and tables. List management lets you select and sort records of variable information to be merged into standardized documents, so you can create individualized mass mailings, for example. And the spelling checker, based on a Merriam-Webster® dictionary, not only catches misspellings but suggests the correct word.

And if that's not enough functionality packed into one package, SAMNA also accepts ASCII files created with other software. So you can use it with Lotus 1-2-3®, dBase II®, even WordStar®.

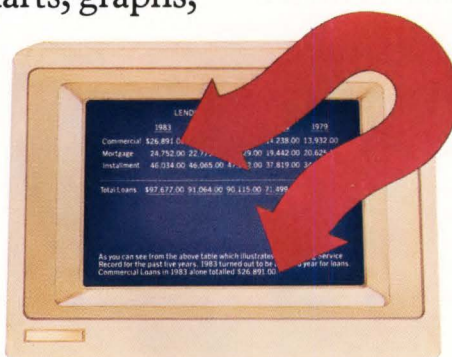
The better you get, the faster SAMNA gets.

With SAMNA software, frequently used functions either have dedicated keys or can be called up with a quick prompt. So as you become more proficient in using the program, you can go directly from one function to another without going back to a lengthy

pull-down menu to select your next keystroke. It's as if SAMNA were thinking along with you, staying one step ahead of what you need to work faster. And with help like that, you *will* work faster.

All of this, plus. It could only be SAMNA +.™

Start with SAMNA's incomparable word processing powers. Add the increased productivity of SAMNA's exclusive Seamless Integration.™ Then include an integrated, interactive



Change a total in SAMNA + 's integrated, interactive spreadsheet and it's automatically changed in the text.

spreadsheet that will allow you to change a number in a spreadsheet and have the resulting change automatically made to numbers in the accompanying text. That's SAMNA +.

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SAMNA can "Zoom" a page down until you can display it all on screen.

They also found that SAMNA could perform multiple formats in a single page or document and much, much more. Much, much more easily than any of these OA professionals had thought possible.

When the comparison was over, all 10 participants saw no comparison at all. SAMNA outclassed any word processor they'd ever used. And word processing was just the beginning.

SAMNA is easy to use. Even if you've never done *any* word processing.

As soon as you get SAMNA software, you can be doing word processing like a pro. Its training and reference manuals are extensive, yet very easy to follow.

Think you'll need more Help? SAMNA offers you an unprecedented three progressive levels of Help.

It gives you information as you need it, so you don't have to learn a function



until you intend to use it.

The first level of Help reminds you of your next keystroke. The second level leads you through the function step by step. And the third level gives you a complete explanation of the function in addition to a guide through it.

If you make a mistake, SAMNA automatically gives you the next level of Help. It won't just tell you you've made a mistake; it will tell you how to correct your mistake, too.

That's more help than any dedicated word processor or PC word processing software offers. Plus you get a free applications newsletter and unlimited use of SAMNA's toll-free INFO-LINE for 30 days (extendable on an annual basis).

Seamless Integration™ means SAMNA can work with text, math, line drawings, and more ...without a break.

SAMNA lets you work with text, then switch to integrated five-function math, free-form line drawing, list management, or spelling checker as you need them, without a break.

Without going back to a window or changing screens. It gives you an uninterrupted

flow of work that's faster, more natural. And more productive.

Call for Help and SAMNA will lead you all the way through any function.

FEATURES

	SAMNA WORD II	SAMNA WORD III	SAMNA +
Alternate Keyboards—Foreign languages, Greek Math, special symbols		*	*
Column support to move, copy, delete or insert		*	*
Column support for newspaper style printouts		*	*
Copy to buffer or file and insert in new location		*	*
Move to buffer or file and insert in new location		*	*
Stored paragraphs accessible by i.d.		*	*
Automatic index generation (alphabetized and with page references)		*	*
Five function math		*	*
Full pathname support for all file functions		*	*
Merge lists of letters in background while working on screen		*	*
Print wheel changes in middle of text		*	*
Proportional print		*	*
Section/outline number in three styles		*	*
Automatic generation of Table of Contents		*	*
User defined functions to record and/or play back commands		*	*
Wildcard support for all file functions		*	*
Proof for spelling errors and hyphenation—automatic corrected options provided—Merriam-Webster dictionary		*	*
Automatic Merge—with selection and sort capability	*	*	*
List management—of 99 fields, unlimited length, selection and sort capabilities	*	*	*
File back up—two versions	*	*	*
Disk/Directory back up	*	*	*
Bold mode or for revision—displayed on screen	*	*	*
Center mode or for revision—displayed on screen	*	*	*
Caps mode or for revision—displayed on screen	*	*	*
Justify mode or for revision—displayed on screen	*	*	*
Underline mode or for revision—displayed on screen	*	*	*
Super mode or for revision	*	*	*
Sub mode or for revision	*	*	*
Double Underline mode or for revision	*	*	*
Required page break	*	*	*
Connect line mark—prints two lines as one	*	*	*
Connect space to prevent words from being separated	*	*	*
Move cursor forward by word, line, paragraph, sentence, page and file with ◀▶◂◃ arrows.	*	*	*
Move cursor backward by word, line, paragraph, sentence, page and file with ◀▶◂◃ arrows.	*	*	*
Go to edges of screen, specified phrase, other file, particular page	*	*	*
User defined defaults for back up, sheet feed, default drive/directory, print wheel sequence, default keyboards, decimal positions in math, negative number display, color graphics, use of color on color monitors	*	*	*
Delete forward/backward in shaded amounts, file(s) from disk	*	*	*
DOS 2.0 support for directories and sub-directories	*	*	*
Direct typing from keyboard to printer—bypass screen	*	*	*
Display up to two files simultaneously	*	*	*
Rename, copy, delete files without closing document or returning to DOS	*	*	*
Repage with widow/orphan control, exact paragraphs, exact lines	*	*	*

FEATURES

	SAMNA WORD II	SAMNA WORD III	SAMNA +
Search and replace with case and attribute consideration	*	*	*
Fold wide documents to compare columns	*	*	*
Exits to operating system	*	*	*
Zoom—miniature page display	*	*	*
Up to 300 footnotes of unlimited length	*	*	*
Multiple formats stored with file	*	*	*
Up to 30 headers and footers per document, unlimited length, option to alternate	*	*	*
Three levels of help—for each function—progressive and contextual	*	*	*
Automatic paragraph indent	*	*	*
Insert text from keyboard as you type, from a stored glossary or from a file	*	*	*
Line drawing	*	*	*
Change pitch and line spacing in middle of document	*	*	*
Number alignment on decimal or comma	*	*	*
Overstrike characters or lines	*	*	*
Auto paging at input with displayable page breaks	*	*	*
Auto page numbers at choice of location and starting number	*	*	*
Insert and place markers for form fill in	*	*	*
Queue up to five print jobs	*	*	*
Print a block of text from screen, page from screen, file from disk	*	*	*
Print in background while working on screen	*	*	*
Protected text from printing on two pages	*	*	*
Scratchpad for typing and printing without saving on disk	*	*	*
Translate ASCII files to use with Samna or Samna files to ASCII	*	*	*
Vertical center lines on page	*	*	*
Initial support	*	*	*
Extended support	*	*	*
800 number	*	*	*
On screen disk based tutorial	*	*	*
Illustrated reference manual	*	*	*
Easy, seamless entering and exiting between spreadsheet and the word processor			*
Multiple spreadsheets in one document—floating cells embedded in text, spreadsheets linked, floating cells linked to any spreadsheets in document.			*
Alpha-numeric naming for spreadsheets, columns, rows, ranges, or cells			*
Uses cells or ranges—relative and/or absolute references to cells or ranges.			*
Full complement of mathematical operators, automatic alignment of numbers			*
Full support of date functions for aging purposes, including use of DOS date			*
Full complement of number formatting within columns and rows to include scientific notation, currency, variable decimal positions, and ability to bold and/or underline cells			*
Insertion, deletion and movement of columns or rows, and erasing or copying ranges, columns, rows, and cells to include formulas			*
Specifies ranges, columns, rows and cells via shading or with coordinates			*
Protects ranges, columns, rows, cells or entire spreadsheets			*
Dynamic printing (without creating print files)			*

*SAMNA is available for IBM PC, XT, IBM-compatible, TI Professional, and DEC Rainbow microcomputers.

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NEWS & COMMENT

(Continued from page 38)

Management Systems (Torrance, CA). Price is \$625 per month.

- "The Analyst"—includes an Apple III with monochrome display, a disk drive, a dot-matrix printer, and Visicalc III software from Visicorp (San Jose, CA). Price is \$570 a month.

- "The Executive Assistant"—includes an Apple II, two disk drives and a controller, a monochrome display, a Sprint printer from Qume Corp. (San Jose, CA), Wordstar (from Microsoft Corp., Bellevue, WA), Visifile, and Visitrend Plot (both from Visicorp). Price is \$470 a month.

- "The Sampler"—gives users a different computer to try for a month at a time for a total of three months.

Leasametric, based in Foster City, CA, also rents personal computers to businesses all over the country. Current offerings include the IBM PC; the Apple IIe, III, and Lisa; Hewlett-Packard's HP 150; the Televideo

1605, and the Texas Instruments Professional Computer. A rental package includes hardware, installation, on-site service, and equity toward purchase. Rentals are on a monthly basis only; software is for sale only. The cost for the basic Apple IIe system is \$223 per month. The price for the IBM PC is \$324. For more information, call (415) 574-5797.

Many rental services restrict their operations to specific regions or cities. Apple-A-Day, located in Elmhurst, IL, promises to deliver an IBM PC, a Compaq portable, or an Apple IIe in a matter of hours, but prefers to stay east of the Mississippi. A variety of printers, modems, and software is also available. The monthly rate for a basic IBM PC with 256,000 bytes (Kbytes) of memory, a monochrome display, and two disk drives is \$376. As might be expected, as you add more features, like a color monitor,

the cost rises. Daily rates are also available. For information, call (312) 843-3080.

For some corporations, regional rental firms are the best option. PC Computer Rental, based in New York, rents to the many large organizations in the immediate area. Clients include Coopers & Lybrand, Citibank, Chase Manhattan Bank, and McGraw-Hill, the publishing company. PC Computer Rental carries the IBM PC XT, Compaq's portable, the Apple Lisa and IIe, a full line of printers, and software. The monthly rate for the IBM PC XT is \$600. The company installs the equipment it rents and offers repair services. Insurance is also included. PC Computer Rental can be reached at (212) 532-2555.

Another company, Apple Rental Inc., differentiates itself from other computer rental services by offering

(News continued on page 49)

**Gold-Writer
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COMPARISON CHART

	Printing speed (cps)	Avg. hours before repair*	User- changeable multiple interfaces	Mfr's suggested retail price
Diablo 630 API	40	4,000	YES	\$2340
NEC 7700 Series	55	2,000	NO	\$2595
Qume SPRINT 11/55 PLUS	55	5,500	YES	\$1990

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See distributor listing
on opposite page.

*Mean Time Before Failure at 25% duty
(manufacturer's published data)

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Bohlig & Associates (612) 922-7011—MN
Butler Associates (617) 964-5270—CT, MA
Byte Industries
(800) 972-5948 (CA Only)
(800) 227-2070 (Outside CA)
David Jamison Carlyle
(213) 410-9250—CA, CO, HI, IL, NJ, TX
Computers & Peripherals Int.
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The Datastore (609) 779-0200—NJ
Equipment Resources (404) 955-0313—GA
Future Information Systems
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Gentry Associates
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Inland Associates (913) 764-7977—KS
InterACT Computer Systems
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Kierulff Electronics
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MD, MN, MO, NC, NJ, OH, OK, TX, UT, WA, WI
MA/COM-Alanthus Data
(301) 770-1150—MD
MicroAmerica Distributing
(800) 431-7660 (MA Only)
(800) 343-4411 (Outside MA)—CA, MA, TX
Midwest Microcomputers (419) 782-1115—OH
National Computers Syndicate
(312) 459-6400—IL, MN
Pacific Mountain States
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PAR Associates
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PCA Microsystems (512) 654-4711—TX
PCS, Inc. (214) 247-9946—TX
Pioneer Electronics
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Polygon Industries
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Printer Warehouse (213) 829-5493—(CA Only)
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R.C. Data (408) 946-3800—CA
Rudor Communications (212) 245-5509—NYC
Schweber
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(305) 621-4237—FL
Tek-Aids Industries
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Tricom (516) 483-9700—NY
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Data Terminal Mart
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Future Electronics
(416) 697-7710—Alberta, BC, Ontario, Quebec
Micro Distributing (604) 941-0622—BC
Printrm Data (416) 977-1711—Ontario

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CIRCLE 19

NEWS & COMMENT

(Continued from page 47)

"free" instruction to customers. David Schwartz, president, gives two hours of instruction on the use of micros and software. The company rents the IBM PC; Apple's Macintosh, IIe, II Plus; and Franklin's Ace. Multiplan (from Microsoft) and Visicalc are available for loan. An Apple IIe or II Plus with printer rents for \$250 a month. The company delivers only in the New York metropolitan area and can be reached at (201) 251-8662.

Personal Computer Services, is another New York-area rental company; it offers the IBM PC and PC XT, the Compaq, the Apple II Plus and IIe, plus modems and printers.

Some of the companies that rent micros continue to do so month after month, according to the leasing companies. Coopers & Lybrand has been renting from PC Computer Rentals for some time now. Why doesn't the Big Eight accounting firm buy the computers it needs? "It's the bureaucracy in any large organization," says Alex Wong, owner of PC Computer Rentals. "A manager submits a proposal to buy a computer, but chances of getting approval are slim because it's not in the budget. It's easier to bury the rental fee in the company's miscellaneous-expense budget." Some companies, he adds, rent because they can charge the cost against operating expenses, a better tax deal than depreciating the cost of equipment over several years.

Protocol links

Protocol conversion was the hottest topic at the otherwise lackluster Interface data-communications show held recently in Las Vegas. Protocol conversion may have productive potential for organizations that until now have been limited to using single-vendor systems.

Protocol converters let users with mainly IBM equipment communicate with non-IBM machines, and, conversely, let non-IBM shops emulate IBM 3270 terminals to communicate with Big Blue's mainframes

and minis. Protocol converters even extend the usefulness of old equipment.

Among the offerings at Interface was a new machine from Avant-Garde Computing Inc., Cherry Hill, NJ. The Net/Guard system monitors and controls communications between personal computers, networks, databases, and hosts.

Net/Guard connects any dialup device to a network, regardless of protocol, and controls access to databases and applications through sophisticated passwords. The vendor claims the device lets users communicate via broadcast messages or direct conversation.

Net/Guard comprises front-end processor interfaces, a system-control unit, user interfaces, modems, an analog-patch panel, a color monitor, a printer, disk storage, and tape backup. System prices start at about \$200,000.

In another development, the Versalynx TM/3278 protocol converter was introduced by Local Data Inc., Torrance, CA. This product adds asynchronous ASCII modes to the normal mode of IBM 3178 and 3278 terminals connected via coaxial cable to an IBM controller. The unit is available for \$695.

Finally, Timeplex Inc. (Woodcliff Lake, NJ), best known for its modem, multiplexer, and tech-control offerings, announced Tru/Blu, a line of protocol converters designed to simplify the construction of integrated networks. The Tru/Blu line carries out conversions between synchronous EBCDIC (IBM) and asynchronous ASCII (non-IBM) data characters, between a variety of speeds, and between coaxial cable and RS-232 interfaces.

The Tru/Blu 74, which emulates the IBM 3274 cluster controller, lists for \$3,900. The Tru/Blu 78, which sells for \$1,695, lets a personal computer or asynchronous terminal provide full-screen emulation of a 3278 terminal via coaxial cable. The Tru/Blu 80 and 87, the other two products in the line, each also cost less than \$2,000 apiece.



by Susan Foster Bryant, Microsystems Editor

PERSONAL COMPUTING

Diverse businesses share concerns

When it comes to personal computing, the issues that concern corporate management are consistent from business to business. Cooperation between users and system developers, acquisition practices, product control, data management, and training all are fundamental concerns.

Alastair I. Omand, executive in charge of information systems and communications at General Motors Corp., Detroit, and John R. Barlow, executive in charge of distributed systems at Aetna Life and Casualty Corp., Hartford, CT, discussed personal computing in two recent interviews conducted by Software Editor David Kull. Omand and Barlow represent diverse businesses—GM is a so-called smokestack industry while Aetna is in the service sector of the economy. But in both corporations, management's perception of its needs for personal computing and the benefits it hopes to achieve are the same.

Omand believes top management should take a hand in the management of personal computing.

CD: How can a corporation get the most from personal computing?

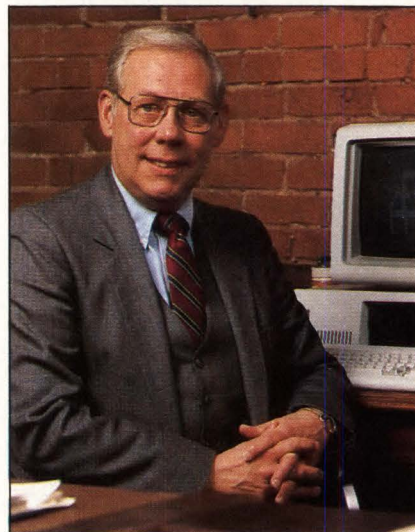
Omand: By paying attention to five issues:

- The management of data, including accessibility, consistency, and security.
- Product proliferation, including how to connect and support diverse devices and how to avoid redundant applications.
- Cost-justification and purchasing policies for acquisitions.
- How to bring together users and MIS professionals who are at different

stages of information-technology maturity.

- The need to train users and information-support personnel.

All of the issues are important, but some are not critical—yet. For example, it's not clear that we should try to control product proliferation at this stage. Some de facto standards have emerged, but they may be temporary,



"I'd like to be able to provide information technology that's predictable, responsive to user needs, and easy to use." *Barlow, Aetna*

because the technology will continue to evolve. The key is to take advantage of products that are available now. Worry about how to connect them only when communications are an immediate need. Let your MIS pros help, but don't give them too much authority. The vendors will design and support products if they hope to survive. Let the users' personal needs determine your product choices.

In acquisition, purchasing departments should be allowed to purchase in bulk and take other cost-saving steps. They're often cut out of the process because of technological issues. That's wrong. Personal computing isn't black magic, and the purchasing specialists should be involved. There is very little risk in an investment in personal computing. Any personal computer we buy will pay for itself—even if it's only by contributing to an individual's education.

There is also little risk in letting end users work through the stages of technology adoption to achieve a mature understanding. When centralized data processing made the same journey, there was more risk. But we're dealing with small-scope systems, not large-scale projects requiring years of effort. And if top management is concerned that personal computers are promoting improper or inefficient business practices, it should get the auditors involved. Let them do their jobs.

CD: Which issues do you see as being most critical for corporations today?

Omand: Data management is crucial because personal computers can control information that's vital to the conduct of business. Individual systems can become departmental systems. When that happens, a red flag should go up—the organization must move to protect the data. If that doesn't happen, employee John Doe may start walking around with vital information on a disk in his briefcase, perhaps without knowing its importance.

Training is important because vir-

(Continued on page 55)

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CIRCLE 20

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We'll tell you where to look. Inside the CIE-7800 and CIE-7850.

The 7800 terminal is plug compatible with the IBM 3178 and all five models of the 3278 series. That accounts for six IBMs.

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any single one of those IBM terminals.

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The monitor tilts, rotates and weighs less than 20 pounds. Move it where you need it.

The detached keyboard has an 87-key IBM compatible layout. It can be user configured into any of 22 different U.S. and international keyboards.

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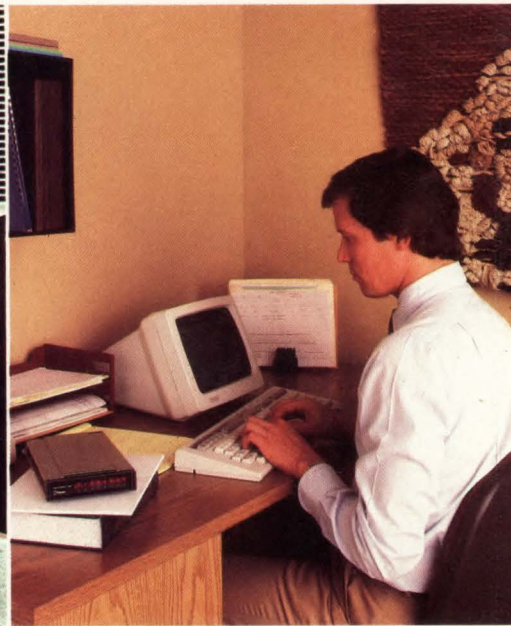
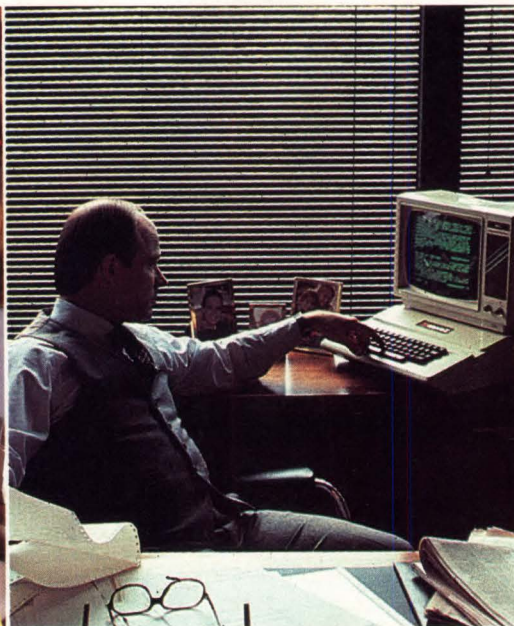
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Hayes. The computer's telephone. Our Smartmodem 300™ and Smartmodem 1200™ connect to any desktop computer with an RS-232C port. They operate with rotary dial, Touch-Tone® and key-set telephone systems. At full or half duplex. And both feature self-test capabilities, as well as indicator lights and built-in speakers for monitoring calls.

The lower-priced Smartmodem 300 is ideal for local data swaps and communicates at 300 bps. A built-in speed selector on Smartmodem 1200 automatically detects transmission speeds (110, 300 or 1200 bps).

Smartmodem 1200B™ is also avail-

able as a plug-in board for IBM® Personal Computers. And Hayes manufactures the Micromodem II® for Apple® II, III, Ile and Apple Plus computers, as well. It comes packaged with Smartcom I™ communications software.

Speaking of software, more programs are written for Hayes modems than for any other. And that impressive list includes our own incomparable communications software.

Smartcom II.™ Complete, menu driven software for the IBM PC, DEC Rainbow™ 100, Xerox 820-II™ and Kaypro II.™ Even first-time communicators will find success with Smartcom II. Screen prompts guide users in the simple steps it takes to create, send, receive, list, edit, name and re-name files.

Tasks like simultaneously receiving, printing and storing data—completely unattended—are easily managed with Smartcom II, because it takes full advantage of Smartmodem's capabilities.

The program reduces lengthy dial-

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Plus, there's an on-line help feature that explains prompts, messages and parameters.

Our reputation speaks for itself. Hayes has five years of solid leadership in the microcomputer industry. Nationwide availability through retail computer stores. Trouble-free factory service and call-in assistance. A limited two-year warranty on all hardware. And the most efficient telecomputing system available. Anywhere.

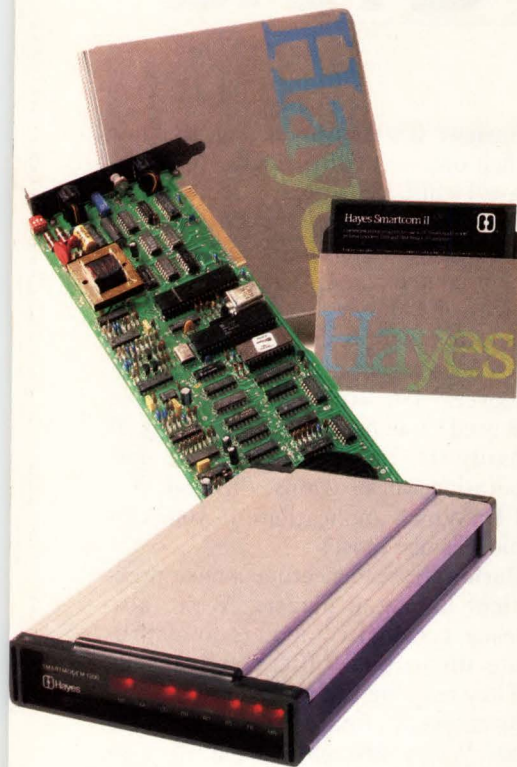
If you're involved in linking micros or setting standards for configurations, remember this. Everything your people need to know about communications can

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Smartcom II communications software, currently available for IBM PC, DEC Rainbow 100, Xerox 820-II and Kaypro II.



Smartmodem 1200 for all computers with an RS-232C interface; Smartmodem 1200B plug-in board for the IBM PC.

Smartmodem Specifications:

Low Speed Data Format: (Smartmodem 1200 and Smartmodem 300) Serial, binary, asynchronous; 7 or 8 data bits; 1 or 2 stop bits; odd, even or no parity (0-300 bps).

High Speed Data Format: (Smartmodem 1200) Serial, binary, asynchronous; 7 data bits; 1 or 2 stop bits; odd, even, or fixed parity or 8 data bits; 1 or 2 stop bits; no parity (1200 bps).

Dialing Capability: Touch-Tone® and rotary-dial pulse dialing.

Command Buffer: 40 characters.

Commands: (unnecessary with Smartcom II software)

A: Immediate answer. A/: Repeat last command. C: Transmitter Carrier. D: Dial command, including simple dialing, waiting for second dial tone, auto-dialing and other features. E: Local echo. F: Full/half duplex. H: Switch hook. M: Audio monitor. O: On-Line. P: Pulse dialing. Q: Quiet mode. R: Reverse originate/answer mode. S: 17 "Set" commands speed, escape code character, number of rings to answer on, etc. S/: Checks operational parameters above. T: Touch-Tone dialing. V: Verbal result codes.

Result Codes: (can be numerical/verbal). 0/OK: Command line ok. 1/Connect: Carrier detected. 2/Ring: Phone is ringing. 3/No Carrier: Carrier lost or never heard. 4/Error: Error in command line. 5/Connect 1200: Carrier detected at 1200 bps. (Smartmodem 1200 only.)

Audio Monitor: Two-inch speaker with volume control.

Rear Panel: On-off switch, power jack, RS-232C connector, modular phone jack connector, volume control.

Operation: Full or half duplex.

Data Rate: 0-300 bps and 1200 bps for Smartmodem

1200; 0-300 bps for Smartmodem 300.

Interface: RS-232C.

Intelligence: Z8™ microprocessor with 4K byte control program for Smartmodem 1200; Z8 microprocessor

with 2K byte control program for Smartmodem 300.

Modem Capability: Bell System 103 or 212A compatible originate or answer mode for Smartmodem

1200; Bell System 103 compatible originate or answer mode for Smartmodem 300.

Receive Sensitivity: -50dBm for Smartmodem 1200;

-45dBm for Smartmodem 300.

Transmit Level: -10dBm.

Registration: FCC registered for direct-connect to the

nationwide phone system. Connects with modular

jacks RJ11W, RJ11C, RJ12W, RJ12C, RJ13W, RJ13C.

Power Pack: U.L. listed 120VAC, 60Hz, 13.5VAC output.

Size: 15" x 5.5" x 9.6"

PERSONAL COMPUTING

(Continued from page 50)

tually all employees—users and information specialists alike—will have to develop a new set of skills. That's going to cost a lot of money.

CD: How should top management deal with these issues?

Omand: The CEO must give one individual in the corporation responsibility—and the necessary staff—for data management. Where in the organization this responsibility resides depends on the corporation's culture and structure.

At GM, we're putting more emphasis on planning, so we're advocating that responsibility for data management be made part of strategic planning. One reason is that the skills needed for data management and strategic planning are similar. Another is that strategic planning is increasingly becoming a matter of tracking flows of information.

"The primary benefits of personal computing may be difficult for an organization to quantify."

Barlow, Aetna

We're encouraging the divisions and the corporate staff to establish what we call "business-information managements," which might be separate units or part of a strategic-planning department. The information managers will help the rest of the divisions exploit the new technology while providing the coordination and control needed for data management. Senior management should also define policies covering security and the scope of personal computing. This will ensure that individual systems don't grow into departmental systems without anyone being aware of it.

CD: And training?

Omand: Many operational employees—managers, clerks, factory workers—will have to learn how to use computers. The purchasing-department staff must understand the technology better than those other workers. The auditors must have a

greater awareness of the risks and methods of assessing them. Programmers will have to learn how to be consultants, an educational effort that will cost a lot of money. The CEO will want to be involved.

Information is the product

The insurance industry's product is information: highly refined cost and probability statistics translated into premiums, and—if the data have been handled properly—profits. The ability to process data quickly and accurately directly affects a carrier's competitive position. Its use of computing power, therefore, is of strategic importance. John Barlow described his employer's need for effective personal computing by employees.

CD: What benefits do you expect from personal computing in the workplace?

Barlow: I'd like to be able to provide information technology that's predictable, responsive to user needs, and easy to use. You're more likely to find these qualities in personal computers than in timesharing terminals hooked to larger machines. Timesharing software is still geared more toward dp professionals than toward executives and general managers.

Business needs should dictate the kind of personal computing an individual should have. Some employees may need both their own machines and timesharing terminals. But you must also make decisions based on economics. What price are you willing to pay for easy-to-use processing at the desk over information in slightly less flexible form via timesharing? A manager needing frequent, timely reports may do better with a personal computer, while an occasional user might get by with timesharing.

CD: Who should choose the technology?

Barlow: The users, in conjunction with a representative from MIS/dp assigned to assist them. Each of our major divisions has a systems-development department, which has responsibility for an ongoing dialog with users about how best to take ad-

PERSONAL COMPUTING

vantage of technology. There are many alternatives—from developing a new Cobol application to acquiring a personal computer. It makes sense to have systems personnel with a grasp of the user department's busi-

ness helping to analyze the choices. But both groups must agree on a solution before it's adopted.

CD: Does this approach limit the users' options in adopting personal computing?

Barlow: It's a mistake *not* to limit their options to some degree. The personal computer's greatest potential is as a multi-function workstation. This implies that the microcomputer will be a component in a network of services. Employees seldom generate data for their exclusive use. They often need information from other employees; data are usually meant to be shared. Unchecked proliferation of hardware and software in the corporation works against this end.

CD: Which applications do your employees use most?

Barlow: Spreadsheets are most prevalent among managers. We're also using personal computers to distribute data to field offices and agents. They're using the machines to develop proposals, figure premiums, and so on. We've developed some of these applications ourselves, purchased some, and we're converting some from small business systems. We're using microcomputers in other segments of the business, but the field-office and agency projects are among our major efforts. We feel they're important for maintaining our competitive position.

CD: Can you measure the benefits?

Barlow: It's a bit early to tell. The primary benefit should be the improved timeliness and quality of information, and that may be difficult to quantify.

CD: What do you see in the future for personal computing?

Barlow: Vendors have a long way to go. They need to improve integration of software so users can easily cut-and-paste from one application to another. We need consistency in data presentation and processing commands. Whether the individual is dealing with a large-scale system or a personal-computer application, the data should look the same and a given command should produce the same results. The primary issue is user acceptance. Employees shouldn't have to go through a lot of effort to get the information they need. If the tools are difficult to use, they will reject them. □



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by Jan Snyders, Midwest Editor

SNYDERS ON SOFTWARE

Stepping up to chargeback

Every department benefits from the activities of the data-processing department. Each is a recipient, at one time or another, of the information dp supplies. For this reason, many companies have instituted chargeback systems, through which individual

departments share in the costs of dp as well as its benefits.

Apportioning costs is the primary—but not the only—advantage dp departments gain from chargeback systems. Another plus is a reduction in the number of frivolous user demands. Because users pay for the

computer resources, they use them more carefully. Chargeback systems also help dp departments plan for expansion of power and equipment, because they keep close tabs on each department's needs.

Probably the No. 1 users of chargeback systems are insurance carriers. As Donald Carlson, systems consultant at Metropolitan Insurance

Chargeback software

Vendor	Package	Requirements	Price	Circle
BMS Computer (415) 938-2620	CIMS	IBM 370, 43XX, 30XX, and PCMs	\$5,000/VS(E) or DOS/MVT/VSE \$6,500/VS1 or MVS \$2,000/CICS \$2,000/VM/CMS	735
Boole & Babbage (408) 735-9550	Control/SMF	IBM 370 and up under MVS or MVS/XA	\$10,000	736
	Control/CICS	Same systems under MVS, VS1, or SVS	\$10,000	
Computer Assoc. Int'l. (516) 333-6700	CA-Jasper/JA	IBM 360, 370, 43XX, 30XX, and PCMs	\$8,500/OS \$6,500/DOS	737
	CA/Jasper/CICS	Same systems	\$8,500/OS \$6,500/DOS	
Duquesne Syst. (412) 323-2600	Jab	IBM 370, 43XX, 30XX, and PCMs	\$6,000	738
	QCM	Same systems	\$14,000	
Gejac (301) 864-3700	Arsap	DEC VAX under VMS DEC VAX and PDP-11	\$3,995 \$3,495/RSTS \$3,495/RSX-11M + \$2,995/RSX-11M	739
Johnson Syst. (703) 821-1700	Jars	IBM 370, 43XX, 30XX, and PCMs	\$7,500/DOS \$12,500/OS	740
	Umax	Same systems	\$4,000/DOS \$6,000/OS	
LMS Engineers (914) 735-8300	Chrgacct/3000	HP 3000	\$3,000	741
Morino Assoc. (703) 734-9494	MICS Installation Accounting Component	IBM 370, 30XX, and 43XX under MVS or MVS/XA	\$28,600 (MICS base) \$7,900 (IA component)	742

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SNYDERS ON SOFTWARE

Companies, New York, says, "It's a law that we provide reports on computer resources used, by policy type, to the state insurance agencies. These reports determine premium and dividend rates at the end of the year." Chargeback systems are instrumental in tallying these statistics.

Metropolitan Insurance has 42,000 employees throughout the United States and Canada, and combined assets of \$57.5 billion. It sells life, property, and liability insurance. Its 16 IBM mainframes are located in five computer centers in Kansas, South Carolina, Pennsylvania, New York, and Ottawa, Canada. There

are over 6,500 IBM 3270, 3279, and 3178 terminals online to the IBM machines. Metropolitan also has Honeywell minicomputers in district offices for sales agents.

Six of the IBM mainframes are dedicated to claims processing on a CICS network. One computer center may handle group insurance, another life insurance, and yet another property and liability. The system can switch to different computers on different days, depending on the type of application and use required.

A few years ago, Metropolitan Insurance decided to replace its in-house system because it was be-

coming too much of a burden to maintain, according to Carlson. The carrier wanted a package that combined performance-monitoring capabilities with a chargeback system. The Komand system, from Pace Applied Technology Inc., provided the combination. It was installed in July 1980. Now, Metropolitan Life knows not only how much a computer is being used at any time, but also who is using it and for what purpose or application. (Major charges to the users are for cpu time and printing.)

A big benefit of the chargeback system, according to Carlson, is in-

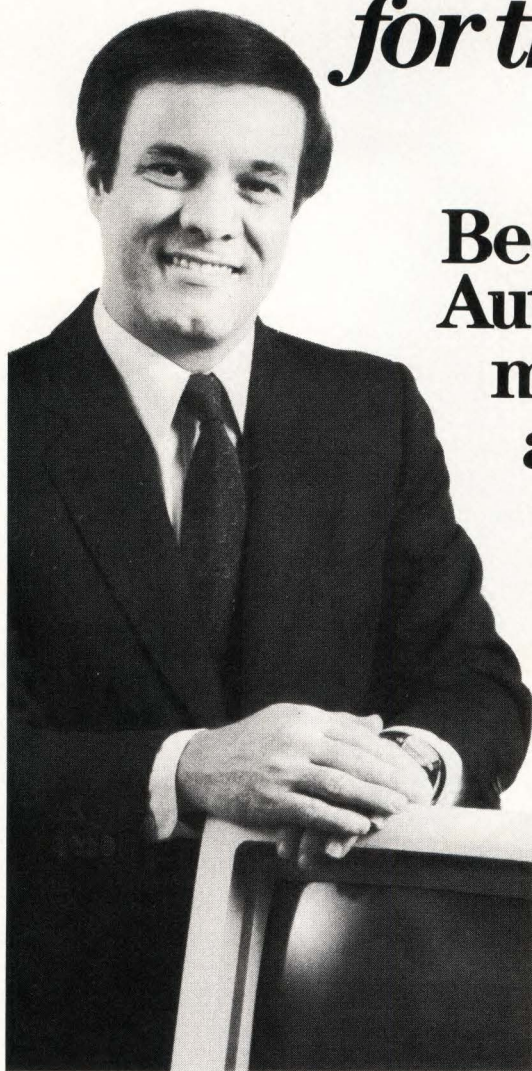
(Continued on page 64)

Chargeback software

Vendor	Package	Requirements	Price	Circle
Pace Applied Tech. (703) 369-3200	Komand/DAS	IBM 43XX and up	\$16,000	743
	Komand/RBS		\$6,000	
	Komand/DIS		\$5,000	
	Komand/DAMS		\$9,000	
	Komand/ICI		\$2,500	
	Komand/CCI		\$2,500	
	Komand/VMCI		\$2,500	
	Komand/OLC		\$3,000	
	Komand/Basic		\$9,000	
	Komand/OBM		\$5,000	
Phoenix Computer (213) 827-4500	Falcon	IBM 360, 370, 43XX, and 30XX	\$19,000/DOS \$24,500/OS	744
Raxco (301) 258-2620	Rabbit-1	DEC PDP-11, VAX 750, and 780	\$2,495/RSTS/E and RSX-11M \$3,995/VMS	745
SDI (415) 572-1200	SDIPMS	IBM 360, 370, 43XX, 30XX, and PCMs	\$5,000	746
Signal Tech. (805) 683-3771	Pacs	DEC VAX 730, 750, and 780	\$2,500 to \$4,900	747
	Ezlog	Same systems	\$1,000 to \$2,200	
Software Clearing House (513) 451-6742	Jaxs	NCR 84XX, 85XX, and 86XX under VRX	\$1,500	748
	Surcharge	Same systems	\$2,000	
	Maxs	Same systems	\$7,500	
Universal Software (203) 792-5100	Jaz	IBM 370 and 43XX under DOS or VS(E)	\$175/mo.	749
	Cams	Same systems	\$110/mo.	
Value Computing (609) 482-2500	Comput-A-Charge	IBM 370, 43XX, 30XX, and PCMs	\$7,000/DOS \$14,000/VS1 or MVS	750
VM Software (703) 821-6886	VMAccount	IBM 370 under VM/SP	\$8,500	751

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**Frank L. Chisholm is Cullinet's Executive Vice President. Frank has worked closely with Cullinet users and prospective users for more than six years. As a key member of Cullinet's management team, Frank has contributed heavily to Cullinet's database product development strategy.*

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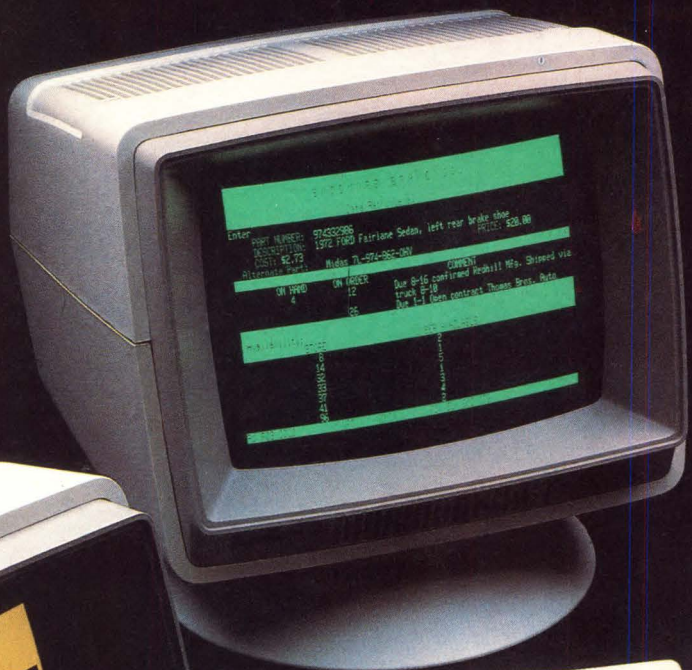
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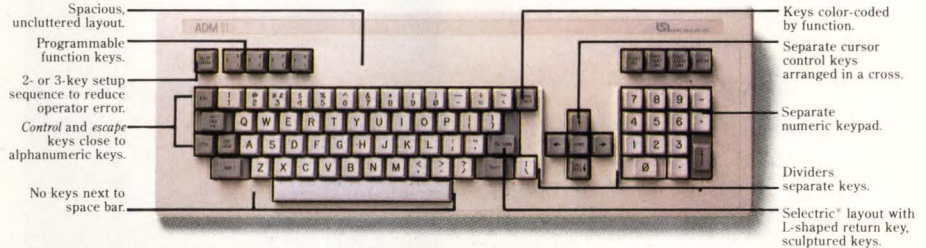
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No. of Pages of Display Memory	1	2	4
Display Memory Configurations (Plus 25th Message/Status Line)	24 Lines by 80 Characters	(2) 24 x 80 or (1) 48 x 80 or (1) 24 x 158	User Definable up to 96 x 80
Scrolling	Standard Scrolling	Smooth, Jump or Horizontal Scrolling Split Screen	Smooth or Jump Scroll Split Screen
Transmission Mode	Conversation Mode	Conversation or Block Mode	Conversation or Block Mode
Editing	Limited	Full Editing & Protected Fields	Full Editing & Protected Fields
Visual Attributes: Reduced Intensity, Blink, Blank and Reverse Video, Underline also on ADM 12 and ADM 24E	3 Embedded 1 Non-Embedded	4 Embedded, 1 Non-Embedded or All Non-Embedded, plus Full Screen Reverse Video	5 Embedded, 1 Non-Embedded or All Non-Embedded, plus Full Screen Reverse Video and Highlight
OEM Flexibility	Modifiable Set-Up Characteristics	Modifiable Set-Up Characteristics & Personality	Modifiable Set-Up Characteristics. Add to Program in ROM or Down-Line Load in RAM (56K ROM or RAM. Up to 22K Display Available) Room for additional Logic Boards.
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SNYDERS ON SOFTWARE

(Continued from page 60)

creased user awareness. "Users can look at the data from three stand-points—that of the user, the job, and the department—to see where dp is spending the money," he says.

Need to allocate costs

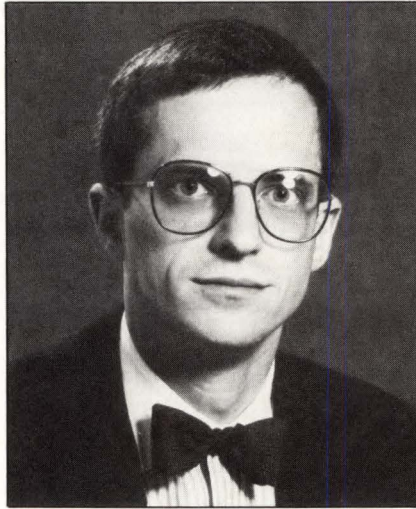
Another carrier, Providence Life and Accident Insurance Co., Chattanooga, TN, also has a chargeback system. Peter Wyeth, EDP security administrator, explains the purchase: "We've always been a cost-conscious organization. We felt there was a need to allocate our high dp costs equitably and, based on that need, we installed Comput-A-Charge from Value Computing."

The chargeback system is used to fully recover all dp-related costs. "We measure utilization of resources and then distribute the cost based on the utilization," says Wyeth.

Providence Life and Accident sells life and group insurance, annuities, pension plans, and auto insurance. Last year's assets were \$3.2 billion. To process its high volume of transactions, the carrier depends on an IBM 3084 and a 3033 mainframe with an attached 3042 processor. There are also 2,000 IBM 3178, 3278, and 3290 terminals online.

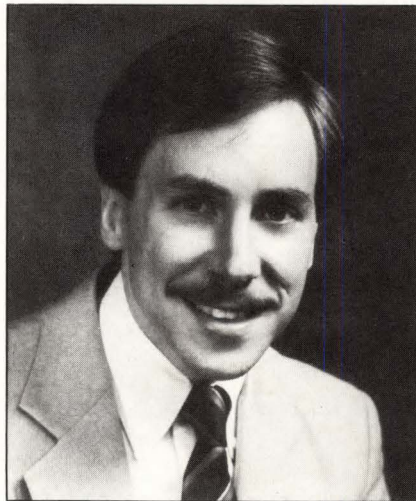
Installing a chargeback system made managers in all departments aware of the true costs of computing, says Wyeth. Initially, dp costs were charged to corporate overhead. Department managers did not have to budget for it, even though they were charged a portion of the overhead on their profit-and-loss statements. "Now that we have a chargeback system," says Wyeth, "the users have a dp budget each year, and we can control costs and prevent runaway growth. We're using our resources more efficiently and contributing to capacity planning."

Doug Ralph, technical-services executive at North American Life Insurance Co. in Toronto, Ontario, Canada, also points to increased user awareness of costs as a benefit. "We can attribute different amounts of cpu-memory and input/output work



"With Comput-A-Charge, we've developed an awareness throughout the corporation of the true cost of using computer resources."

Wyeth, Providence Life and Accident



William A. Zadera, manager of applications support at Citicorp Financial, says CA-Jasper/CICS was installed to check machine utilization but is now being used as a chargeback system.

that's being done, and the users know what the work costs the company and each department," he says.

North American, a mutual-insurance carrier, sells group and individual life insurance in Canada and the United States. It holds \$27 billion in policies; \$3 billion worth were sold last year.

The insurer's 16-Mbyte IBM 3083 mainframe is connected to 125 IBM

3278 and 3276 terminals. Fifty of these accommodate CICS users, and it is to monitor CICS usage that Control/CICS from Boole & Babbage Inc. was installed. Files and data from Control/CICS are fed into an in-house-developed chargeback system that looks after other monitors and batch work.

The insurer's problem was escalating hardware and software costs. "When these costs escalated," says Ralph, "we needed to know where the increase was coming from, who was using the equipment, and how much they were using it."

Control/CICS has introduced order to this confusion. "First of all," says Ralph, "it keeps track of our growth in computer use. We used to go to senior dp management and tell them we were running out of capacity and needed to upgrade our facilities. But we had nothing to support our position." The chargeback system provides the detailed information that's needed.

"The system also gives us a handle on cost benefits," Ralph continues. "We can point out to users exactly how much an application will cost so they have a choice of whether or not to computerize. Everyone understands dollars and cents, and when users are charged for computer usage, they become more aware of the costs."

Paul Brandenburg, assistant manager for the research system at Eli Lilly International Corp. (Indianapolis), agrees that user awareness of costs is the major benefit of chargeback systems. As he puts it, "Management has no idea how much the computer is used. When you provide that information by individual or by group, managers can see where the time and money are spent."

Eli Lilly, which had sales last year of more than \$3 billion, produces pharmaceuticals, medical instruments, agricultural products, and cosmetics. The computer system in Brandenburg's division consists of three DEC VAX 11-780s with 8 Mbytes of memory each. These



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machines support about 400 users and are used for molecular modeling and design, and applied genetic engineering.

Brandenburg hoped to make two improvements with a chargeback system. He explains: "At first, our user group included only those within the department, but as others became aware of our system's capabilities, they wanted to use it. So we became a shared-research data center. After about two years," he continues, "we saw the need to make managers aware of how much they were actually using the system. So we began charging them for services. Some departments may have realized then that it would be more economical to purchase their own equipment."

The second improvement Brandenburg hoped to effect was to group users within categories according to type of usage. "Some users may be working on three or four different projects," he says. "With the chargeback system, each research group can be charged for the amount of time spent on the system."

The Pacs system from Signal Technology Inc. is used as a performance evaluator and a chargeback system at Lilly. Brandenburg's department can collect data on average disk use, average cpu use, average connect time, and overtime. All of those data are placed in a performance database, the information

is analyzed, and trends are reviewed. "Not only can we predict system usage," says Brandenburg, "but we can figure out the best placement of terminals, based on the usage."

Cities can determine usage

Predicting future system use is also a major benefit for the Mayor's Data Center in Chicago, which serves 40 departments and 40,000 employees. One hundred and ninety-five employees operate the center's 25-Mbyte IBM 3081 and 370/158 attached processor. There are 600 IBM 3276, 3278, 3279, 3178, and 8175 terminals at the police, fire, comptroller, and budget departments, and board of elections.

"We sort of backed into using a chargeback system," says James Arneberg, senior systems engineer at the data center. "We were looking for a tool to help develop our budget for 1982-83, and found that we had already installed a chargeback system no one was using. We tried to manipulate and customize it for our system, but that didn't work out. So, after evaluating systems from independent software vendors, we installed Computer Installation Management System (CIMS) from BMS Computing Inc."

There are no exchanges of funds between dp and the other departments, rather, the chargeback system is used to prepare budgets, and pro-

ject and document future costs. "Using the data from the chargeback system," says Arneberg, "the budget department can calculate our growth rate and figure out what our costs will be in the future." The system also provides trend information on data-center utilization, so management can plan if and when a larger computer system will be necessary. Managers can also obtain information on their own departments' cpu use and what that use costs.

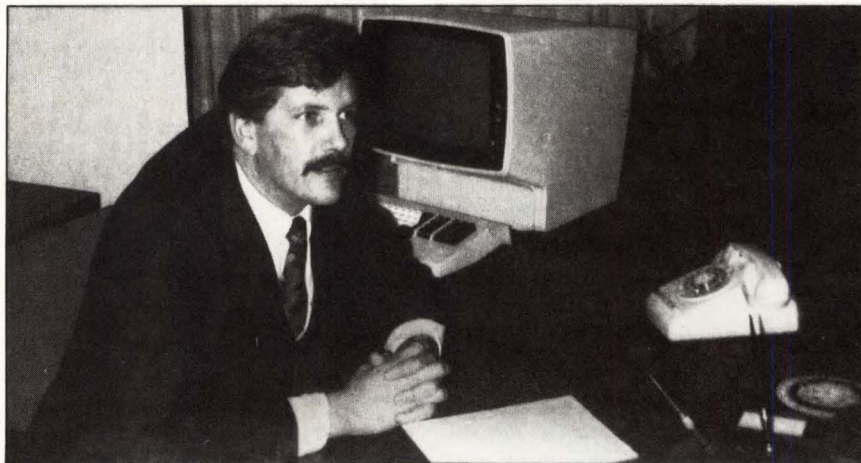
The State of Delaware uses its chargeback system in the same manner as the City of Chicago. That is, dp expenses are not paid out of individual departmental budgets, but are recorded as if they were. The system that maintains these records is Job Analysis and Billing from Duquesne Systems Inc.

The State's computers include a 16-Mbyte IBM 3081, an 8-Mbyte 4341, a 2-Mbyte 4331, and a 2-Mbyte DEC VAX. In addition, there are 300 IBM 3270 terminals online for personnel/payroll, central accounting, and other applications.

The State operates under a "memo budget scheme" that allocates dollar amounts to user agencies. For 10 years, it had a chargeback system in which amounts allocated became the operating budget of the office of information systems, recorded on paper as usage took place. "During the last year," says Jack Nold, director of the office of information systems, "we decided to refine our home-brewed job-accounting system to get our bills out faster." However, the Job Analysis and Billing system had to be heavily modified before installation to accommodate 10 years' worth of embedded procedures.

The chargeback system's benefits lie in its features, according to Nold. "The modeling and retrospective features allow us to examine recovery rates and to determine whether our billing algorithm needs to be updated."

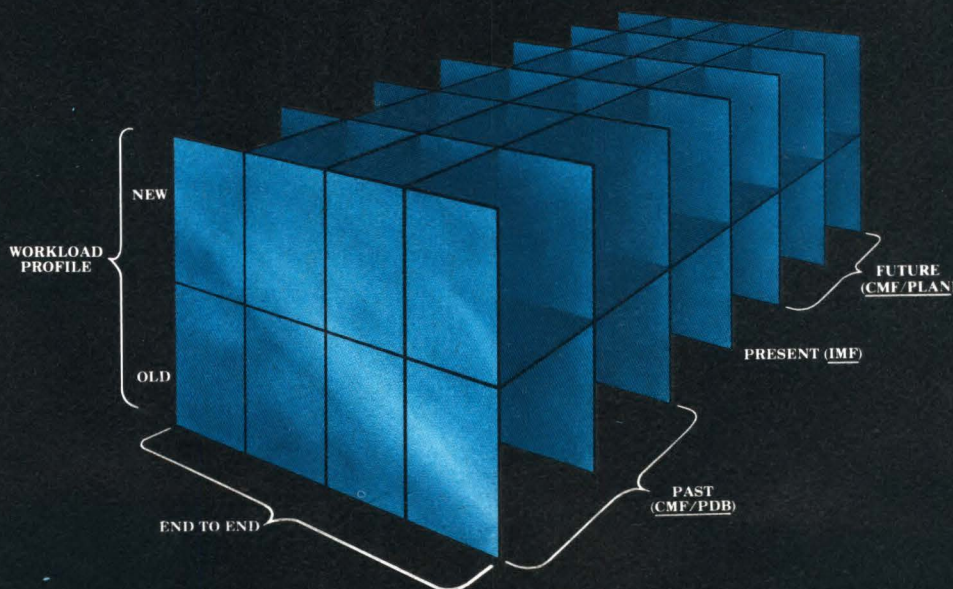
Pratt & Whitney, an East Hartford, CT-based division of United Technologies Corp., is another



A big benefit of Komand, a chargeback package, has been its ability to raise user awareness of computer resources, says Donald Carlson of Metropolitan Life.

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chargeback-system owner. The company's research and development facility in West Palm Beach, FL, which is dedicated to government products like rocket engines, uses DEC PDPs and VAXs. Some of these support

timesharing systems used for offline analysis of test data, like the production of reports or graphic analyses of data acquired from engine or component tests. They are also used for scheduling upcoming tests—they set

up system parameters—and the bookkeeping jobs that go along with that.

Originally, the R&D division had small dedicated systems, and individual project groups "owned" particular machines. "It was easy to decide how much to charge each group," comments Jeremy B. Mann, assistant project computing engineer.

However, as systems grew, with the capability of servicing users from more than one group simultaneously, it became necessary to figure costs another way. The solution was Resource Management and Chargeback System (Arsap) from Gejac Inc.

"Most of the machines are used only for specific jobs," says Mann. "But a number of them are used for several projects at the same time. My responsibility is to produce a single report and a single tape containing information on internal billing from all these systems."

Mann uses one of the larger PDP-11 systems R&D has to combine data from individual machines with data gathered by the chargeback system. That's where the system earns its keep. Says Mann, "Arsap makes it easy to read the acquired data files and combine them with any other information you want to produce your own reports. I can gather data from both dedicated and timesharing systems to figure the cost for every job."

There are times when a company purchases a system for one purpose only to use it for another. That's what happened at Citicorp Financial Inc. in Baltimore. According to William A. Zadera, manager of the applications-support group, Citicorp Financial installed CA-Jasper/CICS from Computer Associates International Inc. to check machine utilization but now uses it as a chargeback system.

With 750 employees, Citicorp Financial provides financial services to about 650,000 customers. It has an IBM 4341 and a 3031, and provides online service to 256 IBM 3178 and 3278 CICS terminal users.

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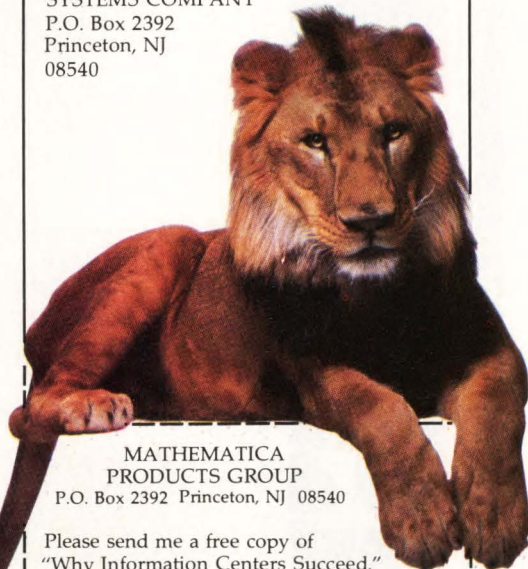
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SNYDERS ON SOFTWARE

(Continued from page 68)

involved in servicing the customer base," says Zadera, "it is important to have a system that reports statistics on central-processing (cp) and system utilization. CA-Jasper provides the information necessary for preparing monthly cp- and uptime-

usage figures.

"The report we find most helpful," continues Zadera, "is the one on daily job-accounting statistics. Using it, we identify idle system time, poor application performance, and peak-utilization periods."

Users are not charged directly for use of computer time. But, says Zadera, "we do allocate costs, according to information from our job-accounting reports. We can look at a particular batch job or series of batch jobs and attribute them to a particular department. We can look at how much they cost to process on a job-by-job basis."

Meanwhile, at the Center for Naval Analysis (CNA) in Alexandria, VA, users want to know how much they are using the computer. The Rabbit-1 system from Raxco Inc. gives them this information.

CNA conducts research for the U.S. Navy and Marine Corps on subjects ranging from current operations to strategies. It uses an 8-Mbyte DEC VAX-11/780 supporting 300 online terminals.

According to Elaine Brehm, systems programmer, Rabbit-1 lets the dp department "associate costs with different projects and contracts. Just as importantly, we can give users feedback on how much time they are using and provide management with information on job costs. There is no way costs could be allocated without a computerized chargeback system," she concludes.

Most users do not understand why and how they may suddenly be charged for services they once received free. That is one reason chargeback systems have become important in so many businesses. They make users aware of their own computer use: Users learn not to expect the impossible, and they evaluate their needs more carefully. □

This is Jan Sniders' last column. After writing "Sniders on Software" for 10 years, Jan has taken a new position. The publisher and editors of Computer Decisions thank her for helping to build up the stature of the magazine and wish her luck in future endeavors. "Speaking of Software," by Software Editor David Kull, will appear in this slot beginning with the July issue. Before taking this position, Dave was our management-issues editor.

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by John Seaman, Data Communications Editor

DATA COMMUNICATIONS

Micros strain networks

A big burden on your network grows heavier every time a personal computer is brought into your organization. Modems are usually added to personal computers six months after they arrive in an office, and the burgeoning use of modem-equipped micros can strain—and possibly even bring down—corporate networks.

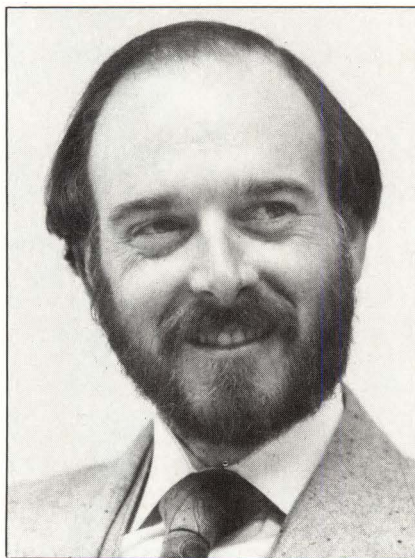
The heart of most networks is a private automatic branch exchange (PABX). The fundamental assumptions about traffic flow through a PABX, which are employed to determine the number of trunks and lines through a network, no longer are true when many micros go online. The extended holding times of micro-based data communications become critical performance factors in some telecommunications networks as the number of online micros grows. The duration of a typical phone call through a PABX is less than three minutes; a data call is, on average, at least twice as long.

"We've run into a few cases in which online personal computers have caused blocks in a PABX or switch," says John Sundwall, a Los Angeles-based vice president of the DMW Group (Ann Arbor, MI). When a switch blocks, callers can't get through. These overloads probably will get worse, he says. "It all depends on the particular user organization and how rapidly it is providing professional workstations," says Sundwall. "When the ratio between personal-computing workstations and employees is one-to-one, an organization has a problem."

Joseph Healey, group manager of voice- and local-communications

systems for Network Strategies Inc. (Burke, VA) breaks the burden of micros into two major types of problems. The low-speed analog trunk, a part of the switched public network, connects to the external side of the PABX through various intermediary devices. These trunks operate at 9,600 bits per second, or possibly 19,200 bps, and that's too slow to handle the online output of a lot of personal computers, Healey asserts.

The second problem arises, says Healey, when personal computers require long holding times for give-and-take, or interactive, conversations with a host mainframe. "Not many micros can run mainframe applications," he says. "You need to make the micro mimic the mainframe, and that kind of transaction takes time."



"When the ratio between personal-computing workstations and employees is one-to-one, an organization has a problem." *Sundwall, DMW Group*

How does this growing problem affect the end user, and what can you do about it? James Rothenberger, vice president of communications planning at First Interstate Services Co. (El Segundo, CA), is attacking the problem with a combination of specialized hardware and dedicated digital-transmission lines.

First Interstate is the dp service bureau for Los Angeles-based First Interstate Bancorp. "We have users in 13 western states, including Alaska and Hawaii," says Rothenberger. "We're moving large files all the time between IBM Personal Computers equipped with 10-Mbyte hard disks." Many of the IBM PCs have Irma cards (from Digital Communications Associates Inc.), which enable them to emulate IBM 3278/3178 terminals. The PCs are connected via coaxial cable to 3274 cluster controllers, which are either locally or remotely attached to the IBM hosts.

Degradation of network performance is unacceptable in Rothenberger's network. "Teller transactions have first priority," he says. "The PCs come second, and as we add more micros, we maintain careful control over where they are and what they're doing."

To prevent service degradations, Rothenberger's group has installed dedicated digital pathways. "We use 56-Kbps Dataphone Digital Service [from AT&T] when we get it, and we've had satellite earth stations (as part of end-to-end service from American Satellite Co.) for over four years," says Rothenberger. "This has given us a start in handling the tremendous data flow." First Interstate also restricts IBM PC transmissions

(Continued on page 76)



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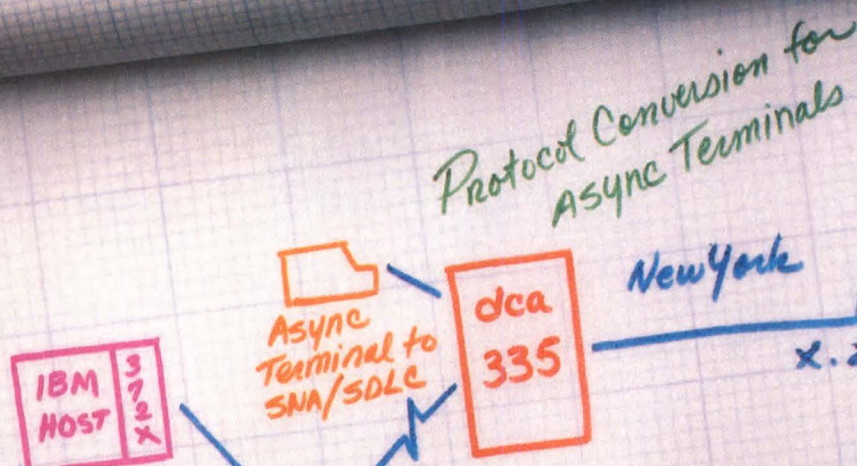
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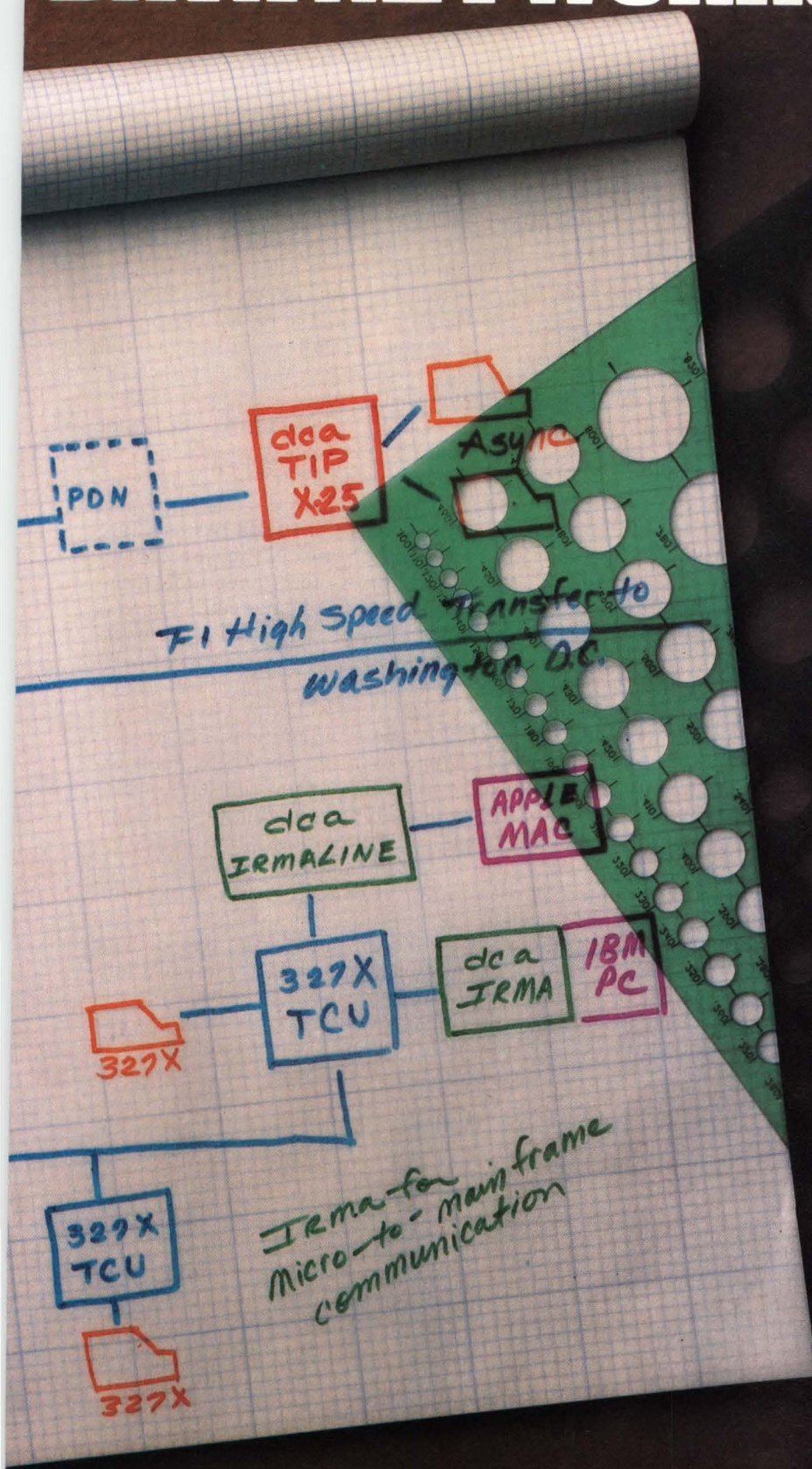
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DATA COMMUNICATIONS

(Continued from page 72)

to off-hours, so as not to interfere with mainstream banking activities. The service bureau also breaks up high-demand resources. "If many users are trying to access one location, such as a payroll database in Reno [NV], we divide and distribute that database to other locations," he explains.

Other solutions

Rothenberger's approach isn't the only way to cope with the network overloads caused by personal-computer communications. Sundwall suggests that network designers can lay the groundwork for smooth communications as they map out plans for growth. In plans for the future, identify communities of interest among users, he says. If user A is online to New York 90 percent of the time and users B and C also talk to New York most of the time, the three can cost-effectively be put on the same path through the PABX.

Both Sundwall and Healey warn not to rely on more capacious hardware to solve the problem. The price you pay for smooth communications may be unjustifiably high. The key is *preventing* conditions that will cause blocking through careful monitoring of communications.

Sundwall recommends a two-step approach. "First, reengineer your switch or PABX to meet the true needs of each community of interest," Sundwall says. "Initially, you can do

this without increasing capacity." The second step is to increase your switch's capacity.

Expanding a switch costs about \$500 per additional board, according to John E. Dulfer of Telecom Planning, Melbourne Beach, FL. Each

"As we add more micros, we maintain careful control over where they are and what they're doing."

Rothenberger, First Interstate

board expands the switch by up to four ports. Dulfer offers a caveat: Make sure the limiting factor in your switch is port capacity and not the switch matrix itself.

Healey notes that as personal computers become more sophisticated, the amount of network capacity needed to accommodate communications between them should fall.

Healey also sees hope in the fast all-digital pathways that are expected to replace the low-speed analog trunks used in most networks by the end of the decade. "Beginning in regions like the northeast corridor, the second half of the problem—the lack of all-digital transmission facilities—will begin to find its solution."

Sundwall believes corporations should replace analog networks with dedicated all-digital transmission

lines. Digital pathways are more efficient, in part because they don't require modems to translate a personal computer's digital signals into analog pulses.

DDS or an equivalent requires some kind of signal converter, however, and that might cost as much as or more than a modem. Direct-satellite links, on the other hand, require coaxial-interface cards. According to Dulfer, the cost of all-digital networks is about 15 percent higher than digital-analog hybrids.

The digital alternative to dedicated lines is voice-data integration on the same lines. That's quite another story, says Howard Frank, president of Contel Information Systems Inc., a Great Neck, NY-based consultancy and systems integrator. Combining voice and data requires careful planning and simulation of the possible configurations. Network-simulation packages are available from Contel and the DMW Group.

As more corporations are forced to come to terms with the network-overload problems caused by personal-computer communications, other solutions may come to the fore. For many managers, however, it may be a bit early to worry about solutions. Now is the time to get a grasp on the magnitude and dynamics of personal-computer communications in your organization, so that you can make intelligent choices when the time comes to pick a solution. □

Coping with micro communications

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Digital Communications Assoc. (404) 448-1400	Irma board	\$1,195	756
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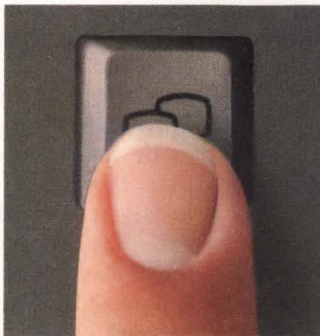
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The word processor as executive tool

Do you find your corporation spending big bucks on personal computers to raise the productivity of executives and professionals? In some instances, the price of personal computers is an investment of dubious quality. Rather than buying new hardware, try teaching those same high-salaried employees to use your organization's underutilized word processors.

"Word processors? Aren't they made for clericals?" you may ask. That's an unproductive attitude. If an executive or professional has the patience and time to learn how to use a personal computer, he or she can certainly learn to use a word processor. In fact, many word processors are much easier to use than micros equipped with word-processing software.

In addition, once executives and pros learn how to use word processors to create and edit documents, they can use the same machines to process data. Using one of a variety of enhancements, users can indeed perform personal-computing tasks on word processors. (Word-processor enhancements will be detailed in next month's issue.)

The executive word processor

I am not suggesting that executives use word processors to compose their own correspondence. Most will still follow the conventional procedure of dictating letters to their secretaries. (Unfortunately, only a minority of executives and professionals have learned to use dictating machines, which are considerably more efficient than direct dictation.)

Only after a secretary has typed a letter into a word processor will the executive put his or her hands on the machine. Correspondence stored on magnetic media is much easier to edit

and revise than paper missives. Working at a word processor, an executive can check over a dictated letter and make revisions in a matter of minutes.

Making changes in a draft is simple at this stage, even for those who can only hunt and peck on a keyboard. Even if they don't make revisions themselves, executives can put notations and suggestions on drafts of correspondence and other documents. Think of the mountains of paper that could be saved if all revisions

"A network linking word processors makes passing a document around for review that much more efficient."

were done electronically! For organizations facing tight deadlines, conversion to electronic word processing can help keep schedules and turnaround as tight as possible.

Professionals who scrawl reports, bids, quotations, proposals, and drafts of sales letters on legal pads will benefit by following the same procedure. (In many organizations, these drafts must be reviewed by several individuals, especially if the document is of high priority or sensitivity.) Documents like contracts, bids, and quotes often require many revisions—and the time savings multiply each time those revisions are made on a word processor rather than retyped. If your organization installs a network linking word processors, passing a document around for review becomes that much more simple and efficient. The efficiency a network offers may not be worth its cost in every instance, however.

Once your executives and professionals become used to reviewing documents electronically, they'll begin creating them almost as a matter of course. After executives are introduced to word processors, it doesn't take much for them to begin creating drafts. They're encouraged to do so by the ease with which the machine produces results. But the special features many machines offer to help poor writers overcome their deficiencies are also persuasive.

Perhaps the best known special word-processing feature is the spelling checker. For poor spellers, these software packages can be godsend. Many spelling checkers let users add words that are not included on the prepackaged list. Spelling checkers also add a new automated dimension to proofreading. Grammar-checking programs are just as useful, and many come with spelling checkers. (Unfortunately, few spelling checkers can detect homophonic errors: *their* for *they're*, for example. Literate workers will be required in offices for some time to come.)

Another time-saver is the boilerplate feature included on many word processors. Standard letters and passages can be stored in small caches of memory and called up by striking a couple of keys. These passages can then be modified to fit the situation.

There's another strong motivation for executives and professionals to learn how to use word processors: confidentiality. How many times have you been forced to risk a breach of secrecy by handing over a sensitive document for retyping? The more people to whom the information is revealed, the more likely it is to be compromised.

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nario, it could also draw unwanted attention from the Securities and Exchange Commission, which is toughening its enforcement of laws prohibiting insider revelations about pending deals by publicly held corporations.

Another good reason to encourage your executives and professionals to become acclimated to word processors is the onrush of the "workstation of the future." Experts and seers predict that workstations will soon sprout on every desk, and they may be right. Many of the new word-processing packages for personal computers imitate the packages that run popular word-processing systems, like Wang Laboratories'. (IBM has just announced that a version of the software for its popular Displaywriter will be offered for the IBM Personal Computer.) If your executives and professionals are familiar with keyboards and commands,

they won't even have to spend much time learning to use these new word-processing packages.

The approach I am recommending will not be implemented easily. Executives and professionals will resist working at a machine that they consider to be a clerical tool. One way to

"Once executives get used to reviewing documents electronically, they'll begin creating them as a matter of course."

help overcome such resistance is to emphasize that word processors are *computers*, not expensive typewriters.

In most organizations, executives and professionals consider word processors to be replacements for type-

writers and using them to be beneath the professional dignity of non-clericals. The evidence of this unfortunate misconception is the long strings of "wp operator wanted" classified ads in the newspapers. This narrow-mindedness will disappear when top management realizes just how expensive it is.

Getting executives and professionals to sit down at word processors won't be easy, but the savings in time and redundant labor will be worth the effort. Also, as inventive software houses release personal-computing packages for word processors, the machines will help introduce highly paid employees to productivity-raising new technologies. The result will be smoother, more efficient operations. □

Herman Holtz is an office-automation consultant based in Silver Spring, MD.

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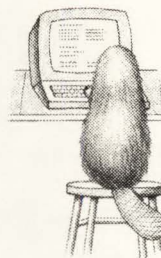
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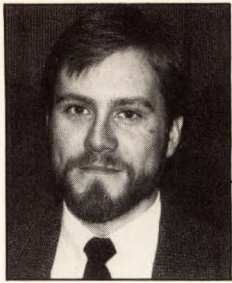
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by David Roman, Staff Writer

TRAINING

Evaluation starts long before training begins

Suppose you send a member of your staff to a week-long course on project management. How do you tell if he or she is actually a better project manager once the training is over? If you have no way of gauging that, then you have no way of knowing whether training has been worthwhile or useless. Unfortunately, one of the most important parts of any training program—the evaluation process—is also one of the most neglected.

"If you're concerned with the quality of training, then you have to evaluate," says Jackie Harris, the manager of training and organizational development for the information services division of Carter Hawley Hale Stores in Anaheim, CA. "You need to find out whether or not your training is hitting the mark."

The training director may be responsible for seeing that all training is pertinent, but the managers who assign training for their subordinates are an equally important factor in the evaluation equation. Working as allies, managers and trainers can assess the value of a particular training course and better it by changing either its content or its manner of presentation.

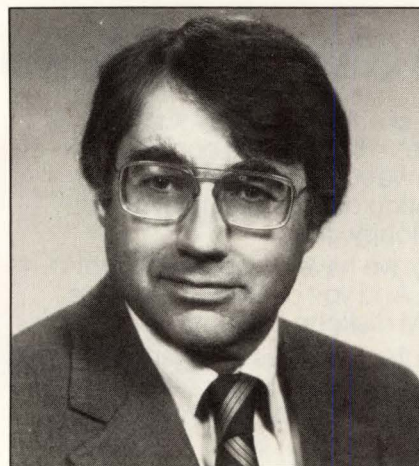
It is particularly difficult to evaluate most of the training that is provided for data-processing professionals because it is designed to convey knowledge or to teach concepts. "It's one thing if you're teaching a skill, like programming," says Edwin Kerr, executive vice president of Q.E.D. Information Sciences, the Wellesley, MA, training organization. "If you go back to test employees, you can see whether they can program better than before. But if you're trying to teach someone to design a database, or manage a project, it's extremely difficult to measure the effect of the

training.

Prejudging the effectiveness of a training program that takes place outside your organization is "one of the toughest calls in the business," according to Chester Delaney, vice president and manager of systems training for Chase Manhattan Bank in New York. "You can ask potential instructors what they'll do in the class, or how they'll deal with certain subjects, but that's the most you can do in advance. There's no way to guarantee the quality of outside instruction."

Some touring seminars and instructors earn reputations for their quality, but it's best to find someone who has already taken the course and can recommend it. Organizations that offer seminars are usually willing to refer you to past students, but your own contacts may prove more valuable.

Kerr of Q.E.D. agrees that "evaluation starts long before anybody ever goes to a workshop. All the evaluation in the world is worthless



"All the evaluation in the world is worthless unless you give a lot of consideration to the total training program from beginning to end."

Kerr, Q.E.D.

unless you give a lot of consideration to the total training program from beginning to end." Q.E.D. requires clients that participate in its workshops to do a little preparatory work before enrolling any employees. "We require all training directors and at least one line manager from each company to know everything in every course we teach," Kerr says. "Then they can use that information to select students for a class. Before we let a student into a class, we insist that his or her employer send us a student profile so we can make sure the person's qualified. We also make sure the students know why they've been selected, and what they can expect."

There's a lot of work that can be done before you assemble students in a classroom—pretesting, identifying student expectations, setting training goals—and these can all be considered part of the evaluation process, according to Jackie Harris at Carter Hawley.

Timeliness is another important consideration. "You waste money if you send people to training two months before you give them an assignment in which they can use what they learned," says Serge Beauregard, executive vice president of Deltak Inc., the Naperville, IL, developer of training courses.

"In order for any kind of training to be effective," says Kerr of Q.E.D., "it has to be directed toward some task or project the students will be doing when they get back to work. You could take the best course in the world on the IBM Personal Computer, but if you're not going to use what you learned, what good is it?"

Rather than work on evaluating their courses per se, Kerr says Q.E.D. "tries to get companies to imbed training into their organization."

(Continued on page 84)

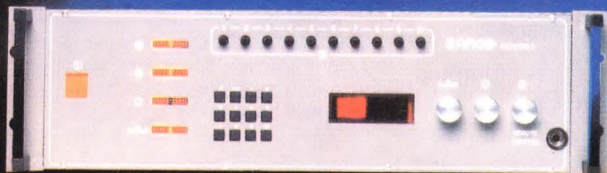
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TRAINING

(Continued from page 82)

This practice serves both organizational and individual training needs, says Kerr. Courses can be evaluated in terms of how they've helped a single worker move down his or her career path, as well as in terms of how they've helped the organization achieve its goals.

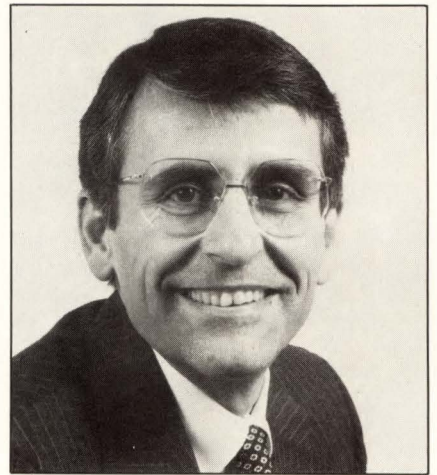
Still, a follow-up effort is necessary in order to discover whether the proper training has been supplied. And the evaluation has to be more than a questionnaire that's filled out at the end of a course. "Any instructor worth his salt can leave a class very happy with him," says Chester Delaney of Chase, "but that doesn't tell you much. What you want to know is, did the people learn what they were supposed to?"

Carter Hawley uses several approaches to answer that question. Students are asked to fill out an evaluation form at the end of a class, but the more serious follow-up occurs

several months later. Through questionnaires, and sometimes through brainstorming sessions that reassemble students from a particular class, Jackie Harris and the organization's technical trainer review the strengths and weaknesses of a particular course. "We ask what worked and what didn't work," says Harris. "What did they want to see more of? The information you get from evaluation procedures gives you a better handle on which direction to go. Without it, you'd be shooting in the dark."

Applying what's been learned

These evaluations have prompted significant changes in Carter Hawley's training program. One notable example is a CICS course once offered via computer-based training (CBT). "On the one hand, we could have just said, 'We do CICS training with CBT, and we've put 50 employ-



"You waste money if you send people to training months before you give them an assignment in which they can use what they have learned."

Beauregard, Deltak

ees through the course," says Harris. "But when we started talking to people, we found we were missing the mark. The whole course was ineffective, and there was no learning taking place, so we looked for another way to go about it. The CICS training is now offered with a live instructor.

Sometimes the inadequacies of a course can be remedied quite easily, particularly in the case of live instruction, which can be changed without having to redesign a course and without expense. A lecturer can be asked to change his or her presentation. It is crucial that the evaluation process is carried through to its conclusion, implementing the changes indicated by the evaluation. One trainer I talked to at a Fortune 500 company said it was too expensive to rewrite any of the CBT courses offered, even if students did find fault with them. Such an attitude makes further evaluation pointless.

"The final results are revealed when the students go back to their jobs," according to Ed Kerr. "You can tell if a course has made them better workers. Their projects will come in on time, or the system designs will be better. If their performance has improved, that speaks for the course. If it hasn't, then you have to question the training." □

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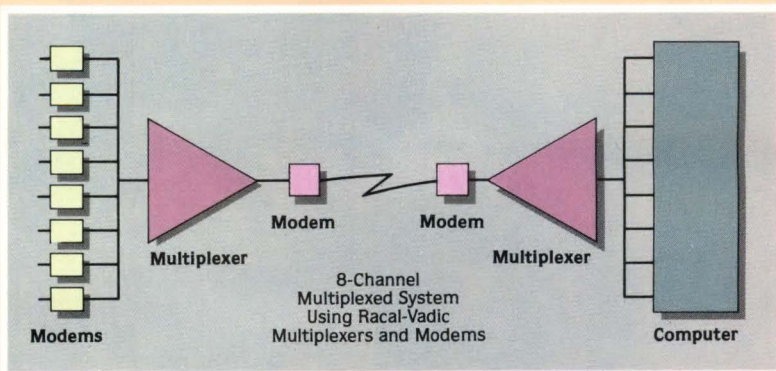
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CIRCLE 21



Toyota, Torrance, California

Outstanding Data Center

Top officials at Toyota Motor Corp. planned the auto maker's data center in Torrance, CA, with employees in mind. "Toyota recognizes that people are its most important resource," says Robert Best, director of MIS/dp at the two-year-old data center. "We wanted to create surroundings suitable for every worker, keeping in mind that a secure, comfortable employee will perform to his or her highest potential."

Each employee at Toyota's American operation made suggestions on the color and layout of the data center, on the office furniture, and even on the artwork that adorns the walls. The result, Toyota believes, is an attractive yet functional facility.

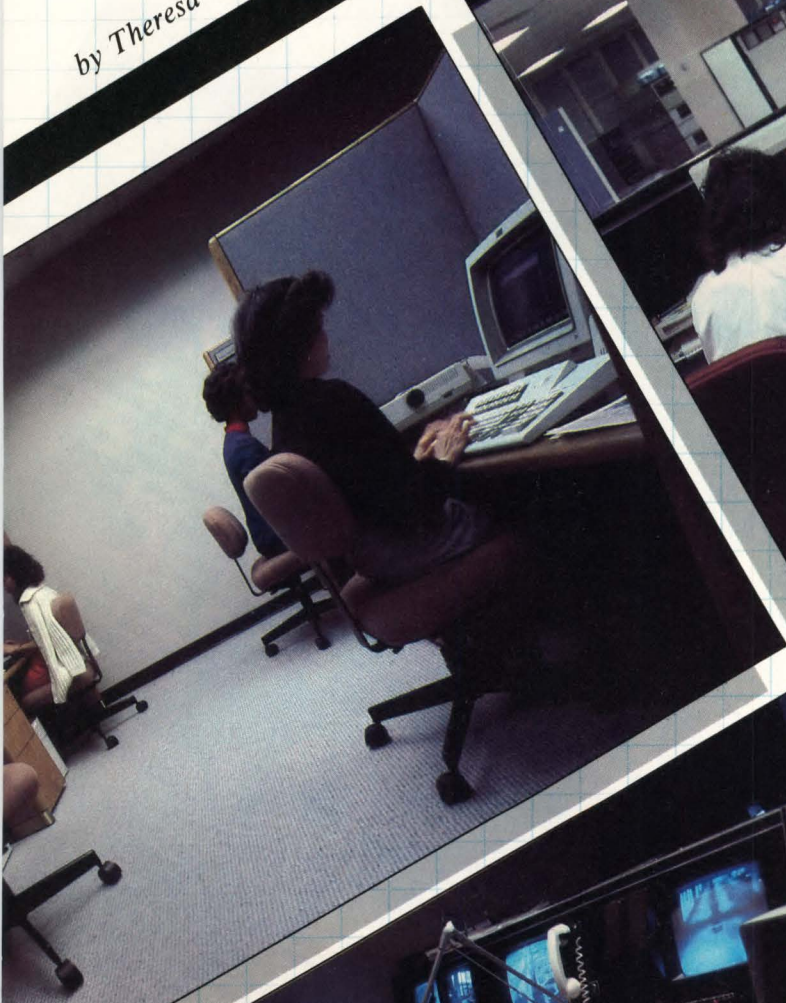
(Continued on page 90)

Located at Toyota Motor Corp.'s United States headquarters in Torrance, CA, the data center (above) was built by C.L. Peck Co., Los Angeles, and occupied in July 1982. The center houses 186 employees, 120 of whom are dp pros. William L. Pereira & Associates, a local firm, designed the facility. At right, Pio Acayan, computer operator, mounts a reel on one of Toyota's IBM 3420 magnetic-tape drives.



by Theresa Conlon, Staff Writer

Photos by Pierre Kopp



Clerks enter data on a Four Phase system linked to an IBM 3033 (above). Workstations were designed for high efficiency and comfort. Wall panels absorb noise. Toyota an Panel systems give unlimited number of office layouts from which to choose.



The control area (above) is in the center of the main computer room, letting operators watch the equipment. Says Best, "It's all done from inside this room." The set-up has reduced clutter in the computer room—and it's comfortable.



The data center is monitored round the clock from a central guard station (left). Remote cameras and all alarm systems are tied into this site. Guards also open the employee entrances from the console. Toyota has two safeguards against power outages. A battery backup system (above) will maintain power for 25 minutes. Motor-generators kick in when the batteries are exhausted, keeping vital systems running.



Outstanding Data Center

(Continued from page 89)
 A network for Toyota's 1,100 independent dealers nationwide is one of the most important services supported by the center. "Outside of Ford [Motor Co.], we're the only automotive company that offers computer services to its dealerships," asserts Best. By providing dealers with computer services, Toyota hopes to give them a technological edge in a highly competitive industry. Two years ago, Toyota began leasing IBM 5285 computers (about 700 in all) to its dealers. The program had a start-up cost of about \$15 million. "This program helps us sell cars," Best says. "The equipment allows the dealers to sell from a national inventory. If a customer wants a yellow Corolla and the dealer doesn't have one in stock, he or she uses the network to find a dealer that has the right car."
 Dealers use the same system to order

(Continued on page 94)



The library (above) on the second floor is available to all employees. Copies of documentation are stored here. Backups of vital data are taken to an outside site daily—a precaution against events that could shut down the data center.



In the control room, a console (above) displays the computer-room layout. If equipment malfunctions or something goes wrong—for example, if a door is left ajar—the panel identifies the location of the problem and alarms sound in the data center and guard station. The console is tied into the security system covering the entire complex.

A skylit spiral staircase (right) adjacent to the reception area is an elegant touch. At the bottom of the stairs, a fountain reflects the colors of a large flower garden outside the center.



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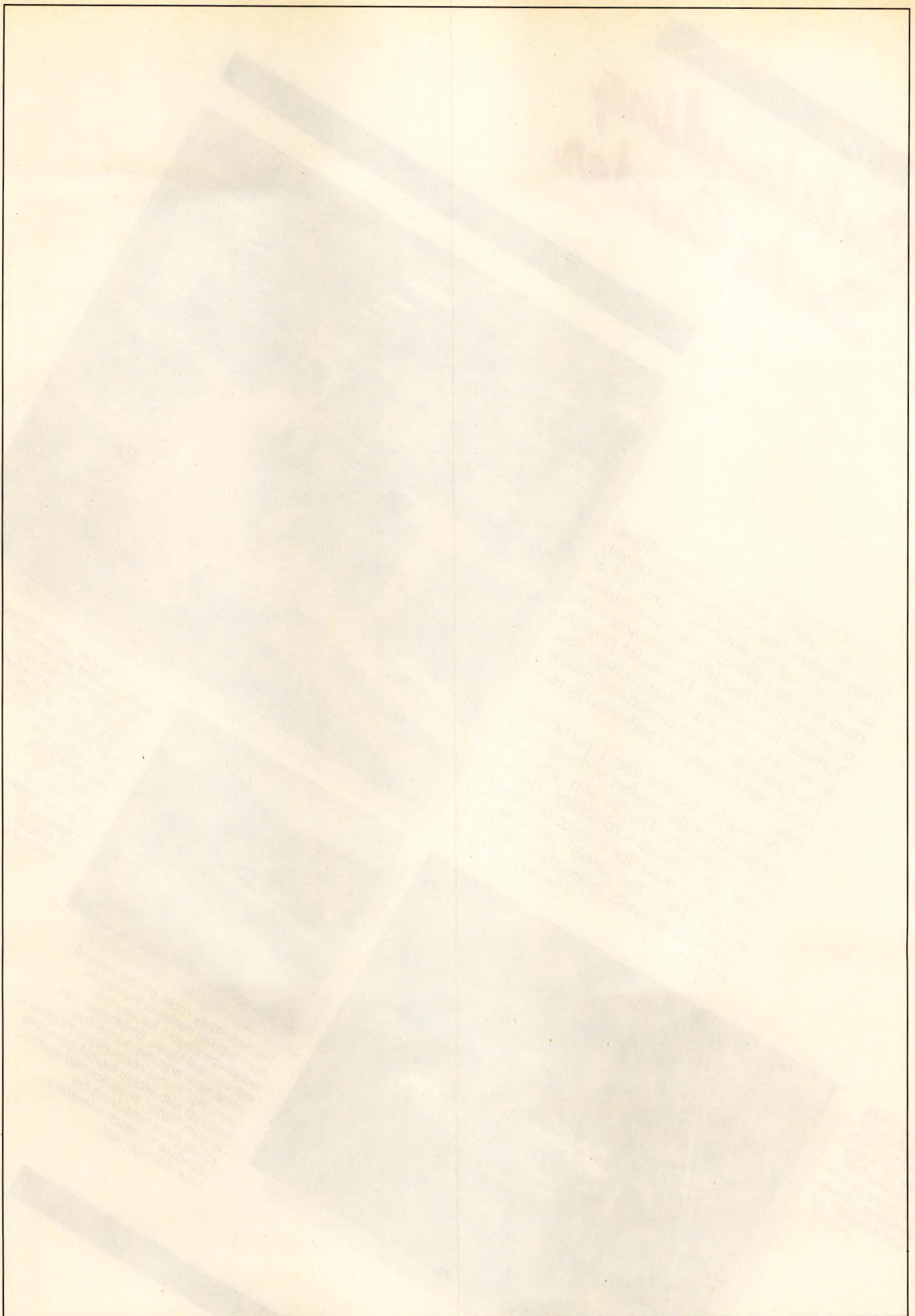
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Outstanding Data Center

(Continued from page 90)
parts and submit warranty claims. Toyota offers dealers four systems, each roughly corresponding to dealership size. All of them provide a 24-hour-a-day communications link to the host IBM mainframe at the Torrance data center. The dealer program is run as a nonprofit operation, says Best. The costs of telephone connections, maintenance, and training are built into the lease fees.

Of course, dealers aren't particularly worried about the comfort of the data center's employees. They're only concerned about the network's reliability. However, happy pros make for a more trouble-free system. Thus, the careful planning that went into the center indirectly serves dealer interests, too.

(Continued on page 96)

Robert Best, MIS/dp director, (right) confers with his secretary, Jeanne Blair, Furniture for the managerial offices was supplied by Hiebert.



The computer room (above) features IBM equipment. "Because we have one supplier, we don't need a big technical staff," says Best. The host computers are two IBM 3033 mainframes, each with an internal-memory capacity of 12 million characters.



The self-study room on the second floor (above) contains Panasonic videotape players for viewing educational tapes. Employees can come here anytime during the workday. Toyota encourages its pros to keep up with technological advances. William Taylor, programmer/analyst, takes some time from his schedule to watch a lesson on time management.



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Outstanding Data Center

(Continued from page 94)

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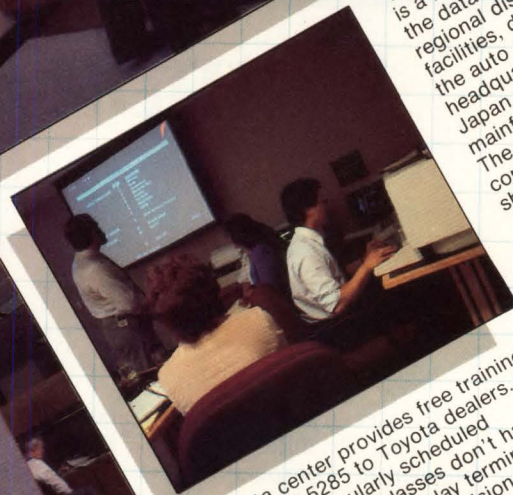
UPS
Emerson Electric
(714) 545-5581
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Video equipment
Panasonic
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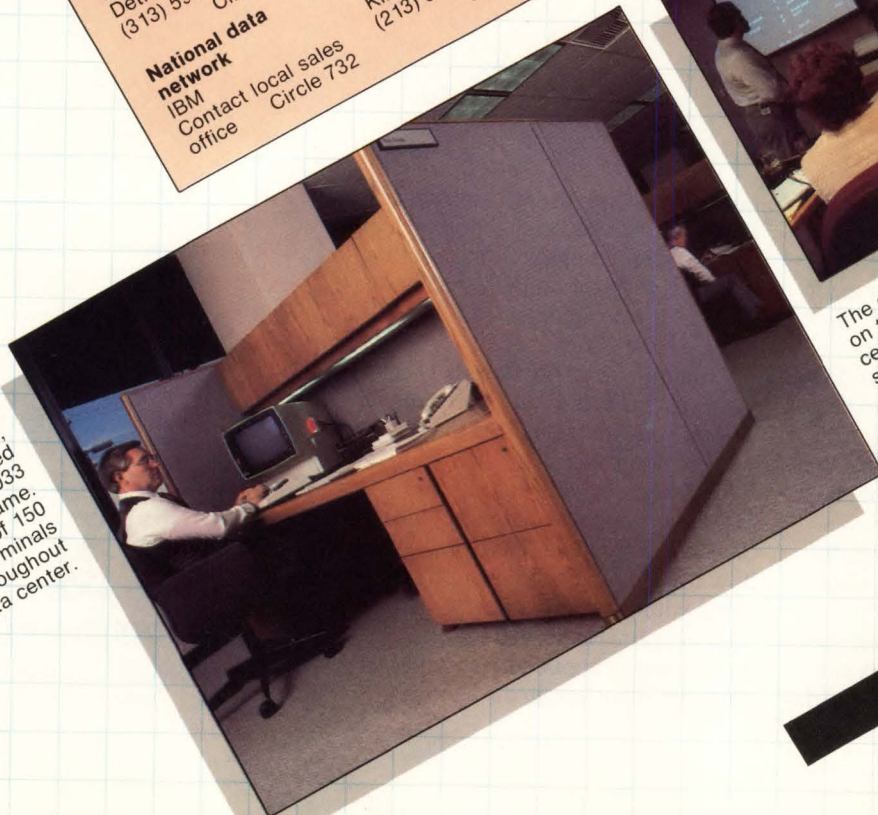
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The Toyota dealer network is a major service run by the data center. It links regional distribution facilities, dealers, and the auto maker's headquarters in Japan via IBM mainframes. The network-control center is shown above.



The data center provides free training on the IBM 5285 to Toyota dealers. The center runs regularly scheduled sessions, and full classes don't have to crowd around one display terminal to get the picture. A Barco Vision camera projects one display onto a wall screen for the whole class to see (above).



At right, Bob Arends, operations manager, works on his IBM 3279 terminal, which is connected to a host IBM 3033 U12 mainframe. A network of 150 3279 terminals reaches throughout the data center.



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INFORMATION CENTERS: POWER

Third in the 1984 series of roundtables

Roundtable participants included (left to right): Jeanette Bordelon, Hoy Heise, Hal Feinleib, Marsha Seidman, Frank Giannantonio,



Employees suffering information-age distress find help in many organizations these days at the other end of a phone call. Hot lines staffed by experts in personal computing, data processing, and communications dispense first aid for minor bugs, advice on how to gain better control of data and word processors, and guidance toward long-term relief of the feeling among users that they should be getting more from their technology. These services are part of, and help define, information centers in corporations across the country.

In many ways, information centers seem to be a twist on the old '60s slogan, "Power to the people." More and more organizations are establishing groups to help their employ-

ees make the most of information technology. Many, adopting an IBM term, call these operations information centers, while others coin their own names. The centers may differ in the services and facilities they offer—indeed, a center may not be a place at all, but only a box on an organizational chart or a responsibility detailed in a job description. But information centers all have the fast, convenient characteristics of the hot line, and they all endeavor to empower users.

Computer Decisions recently invited a group of corporate information managers and others with wide experience with information centers to explore the concept in a roundtable discussion. They began by describing the impetus behind the information-center movement.

Hoy Heise: We've had a timesharing service at American Can for more than a decade. But it was highly technical, mostly supporting programmers, scientists, and engineers. About three years ago, we decided we weren't helping business users as much as we should. As projects were coming in two years late at double their budgeted costs, we were losing our credibility with users.

Woody Sterns: At Grandmet, our center grew out of an information crisis brought on by an acquisition. We'd bought a group of soda-bottling franchises in California. They were facing tough competition and the repercussions of new refundable-bottle legislation, and our corporate headquarters had no way of getting the information it needed to deal with the situation. We went to Manage-

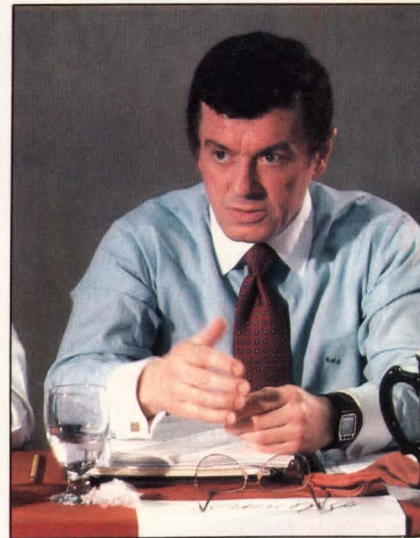
The information center is an important rallying point for those ushering in tomorrow's technology.

TO THE PEOPLE

by David Kull, Software Editor

and Woody Sterns.

Photos by Ted Hardin



ment Decision Systems' Express via timesharing for a quick, easy way to get a handle on the franchises' information needs. Our experience with Express prompted a \$100,000 study to develop an information center for the entire company.

Marsha Seidman: We don't have an information center ourselves. But our surveys of companies that have them reveal data-processing backlogs have been the primary reason for establishing centers. Backlogs ranging from two to six years prohibit end users from getting the information they need for business decisions. The need for that kind of data has combined with the proliferation of personal computers (which made managers more willing to get involved with computing) to spur development of information centers.

Nick Ziccardi: About a year and a half ago, European American Bank looked at its bills for outside timesharing services, at its applications backlog, and at the demands for timely information—all of which were growing—and decided to implement an information center. We established a pilot project that integrated information-center concepts within data processing. Today, the information center runs on a separate system. Its main function is to provide an understanding of the information available in the corporate database, and to regulate access to it. We've also given the information center responsibility for supporting personal computing and we're in the process of expanding this responsibility to include the entire spectrum of office-information technologies.

Trish Fineran: The Department of Agriculture set up a center in response to all the factors we've been discussing. But another reason was the department's diversity of data-processing equipment. The department has about 43 agencies and staff offices, most of which are funded directly by Congress. All have been going their own way with dp. When we began talking about sharing information within the department, incompatibility was an obvious problem. It was clear that top executives had to set the direction for adopting information technology, but that they were not comfortable with the technology.

Jeanette Bordelon: When Helene Curtis introduced a major product recently, our president wanted to support the marketing and sales pro-

Info Centers

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David T. Northrop, Mary Alice Johnson, Alan Stutz, Nick Ziccardi, Trish Fineran, James Webber, and Dick Tuhy (left to right)



fessionals with comprehensive, up-to-date information. The existing batch processes couldn't do the job so we brought in Information Builders' Focus, a fourth-generation language. Our information center is in its infancy, but it was born of the demand for current information that would allow our marketing and sales staffs to compete.

David Northrop: At CBS Magazines, we saw computing power begin to migrate to end users. We wanted to address that issue head on, rather than let it happen helter-skelter.

James Webber: The overriding force behind information centers is the movement toward placing responsibility for profit and loss lower in corporations. Executives running business units are saying to management, "If you want to hold me accountable for profits and losses, you've got to let me have the information I need."

Dick Tuhy: About three years ago, Warner-Lambert noticed that a lot of employees were tying into the timesharing service before they were trained. They weren't making very effective use of it. So we set up a structure to manage training and track the new end-user technology that was coming down the road. Our

information center doesn't contain hardware. It's a service.

Several participants contend that the information center exists more as a concept than as a place. Some believe, in fact, that the name is misleading. The function envisioned for the center is better fulfilled through a decentralized organization.

Sterns: The information center isn't a physical location with a large budget and staff. It's a philosophy, which should lean toward distributed, decentralized processing.

Alan Stutz: IBM saw the information center as a way of providing quick-and-dirty programming tools to take the heat off project-development teams. At General Foods, we already had a quick-and-dirty-programming group, but it was a failure because it didn't take care of users' needs. At about the time the idea for a center arrived, we had this rush of technology—personal computing, graphics, communications, and so on. The center became a way of coordinating this march of technology.

Heise: *Information center* is a misnomer. In my building, there are probably 12 information centers, each one set up by the users themselves. Our users are very proficient

at developing decision-support systems on their own. All they've needed from the information-services department is a programmed extract from a database from time to time to get them going. That's the last we hear from them unless they get into a little trouble.

You can call this distributed processing or departmental computing or whatever else you want. The information-services department provides a valuable service by evaluating new products and technology, getting users started, and providing occasional help. There may also be a secondary effect after information centers take hold. You may find different groups developing common applications, which, taken together, will assume a larger scope than was originally intended. Then we'll move back toward building systems, with corporate models tying these applications together.

Bordelon: No matter how diffuse processing becomes, you'll always need some central link, someone to coordinate all the changes.

Mary Alice Johnson: Users don't want to become dp experts. Neither do they want to run their own telephone systems, worry about mail

discuss how to successfully implement an information center.



distribution, nor decide who's going to empty the wastebaskets. You might look at the information center as a service that provides information and handles the technological details users aren't concerned about.

Stutz: The question is, how deep should data processing's involvement be? The traditional dp concerns about standardization, duplication of effort, and redundancy are almost irrelevant when you're trying to push the technology and data out into the organization. Should we really care whether users A, B, and C are using the same hardware, software, or protocols as user X? It's probably not worth the effort it would take to standardize, optimize, and document the applications. The users are happy and doing what they want to do. They're buying the personal computers, workstations, and software.

Bordelon: Nevertheless, users can go overboard. When the suppliers promise them all 57 varieties, it's up to the information center to help users narrow the choices logically, rather than allow them to buy the whole package willy-nilly.

Stutz: You're assuming that users are irresponsible and have no expertise. That's wrong. Users in most large

Roundtable participants

Moderator: David Kull, Software Editor, *Computer Decisions*.

Jeanette Bordelon, information-center coordinator, Helene Curtis Inc., Chicago.

Hal Feinleib, president, Nonprocedural Systems, Westport, CT.

Trish Fineran, director, information-technology center, U.S. Department of Agriculture, Washington.

Frank Giannantonio, director, information services, Avon Products Inc., Rye, NY.

Hoy Heise, director, corporate systems and programming, American Can Co., Greenwich, CT.

Mary Alice Johnson, principal personal-systems associate, Mutual Benefit Life Inc., Norwich, CT.

David T. Northrop, director, planning and advanced-technology systems, CBS Magazines, Greenwich, CT.

Marsha Seidman, president, Crwth Computer Coursewares, Santa Monica, CA.

Woody Sterns, formerly manager of consulting services, Grandmet USA, Montvale, NJ.

Alan Stutz, manager of information management, General Foods Corp., White Plains, NY.

Dick Tuhy, manager, user-computer services, Warner-Lambert Co., Morris Plains, NJ.

James Webber, executive vice president, Omicron, Morris Plains, NJ.

Nick Ziccardi, vice president, European American Bank, Westbury, NY.

Computer Decisions thanks Omicron, The Center for System Humanics, for its assistance in organizing this roundtable. Omicron is located at Atrium I, 202 Johnson Rd., Morris Plains, NJ 07950; the phone number is (201) 267-0024.

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corporations are very sophisticated. They don't need us to tell them which computer to buy. They may want to ask how they can get access to certain kinds of data. If they don't want to ask, we can't impose ourselves on them.

Webber: That approach is fine as long as five years from now the company president doesn't look at a morass of systems and ask MIS how it permitted the mess to happen.

Hal Feinleib: It's more valuable to let users experiment and discover what computers can do than it is to hand them finished reports. It often takes a user longer to assimilate the information in a report than it does to generate the report. Users should set up their own systems because during development, they'll learn much about the nature of the information available to them. They get a better understanding of what the numbers mean.

Tuhy: Some of the disagreements we've been expressing reflect our different perspectives. Organizations are at different points in their adoption of information technology, they have different goals and different cultures. They don't need all the same services from an information center.

Corporations take different approaches to determine their needs for information centers. Participants describe implementation strategies ranging from formal planning to pragmatic reaction. But the differences seem to depend as much on philosophy as circumstances.

Stutz: You can't plan for an information center. You have to form an idea of the capabilities you want. But there's no way of knowing whether you'll need five employees, 10, or two. A lot depends on the sophistication of the users—and that will change.

Fineran: You can plan only so much. We began by trying to meet an overwhelming need to support end users. As we went along, other concerns became apparent.

Webber: When setting up information centers, most companies don't emphasize needs analysis—perhaps because they don't have to. They don't need to make a large investment because they start with whatever hardware and software is on hand. Once the concept takes hold and they start considering buying 10,000 personal computers or a \$100,00 software package, they do more in-depth analyses.

Johnson: Our planning lasted about two weeks. We were up and running

with one package and had more than 70 productive users within a year.

Frank Giannantonio: At Avon, we planned from the beginning. Every year, data processing analyzes user requirements and seeks approval from a steering committee for the projects needed to meet them. The information center grew out of the wish list compiled after one of these annual studies. Data processing made two lists—one of the projects we could handle with traditional methods and another of those we wouldn't be able to touch. From this second list, we identified projects that an information center could tackle. We were able to justify the hardware and software with the benefits the users had identified for these projects.

Seidman: Sometimes it's easy to cost-justify an information center based only on reduced charges for outside timesharing services that are brought in-house.

Sterns: In 1981, I asked my superior, the executive vice president of finance, for about \$100,000 to study the need for what became called an information center. I was surprised to get approval because I didn't really know how to describe what I was looking for. We talked with major IS users in our subsidiaries, found their critical information needs, researched ways of meeting them, and set up an implementation timetable. The funding went for travel, product analysis, and two small pilot projects to test the concept. After 16 months we were ready to purchase a product—Express. We asked the subsidiaries to estimate their usage



"Users don't need us to tell them which computer to buy. We can't impose ourselves on them."

Stutz, General Foods

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Info Centers

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and allocated the costs based on those projections.

Bordelon: At Helene Curtis, planners started out by looking at the services that would be productive for users, rather than at the resources we'd need to provide them. Over the next six months, we're going to have real problems because we took this approach. We've loaded our information-center applications—primarily Focus for our marketing staff—on the production mainframe, an IBM 4341. We also recently brought in Tell-A-Graf from ISSCO at the behest of the finance department. I think we're taking on too much too fast—in terms of providing training, support, and machine capacity. We're considering adding an IBM 3083 for production and dedicating the smaller computer to the information center.

Ziccardi: We started with a pilot project on our mainframe, so planning didn't cost us a dime. We'd heard that the concept worked well for other organizations. Once we found from the pilot that it worked well for us, we bought a mainframe for the information center.

Stutz: Everyone is talking about downloading from mainframes and about analyzing user requirements to decide which packages they need. We've been doing that for 20 years

with timeshared computing. Today, with the emphasis on personal computing, the end user should drive the process. We can provide support, but it's up to users to decide what they want to buy and how to justify the cost—and then get results.

Feinleib: I don't care how many million instructions per second (MIPS) you put on a chip, there will always be the problem of limited computer power. As a user myself, I can think

"The information center provides data and handles details users aren't concerned about."

Johnson, Mutual Benefit Life

of problems I'd like answered that would stump any machine. I see the information center becoming a means for workers to get the information they need. That could mean providing access to all the information in the world—and that's a tall order.

Sterns: You have to plan to provide the right amount of computing power. Planning also helps you allocate costs and gain top-level support for expenditures on an information center. IBM's Business Systems Planning (BSP) is an eye-opener for

users and management. After the study, you sit them down to look at the whole picture. They see where the money's going and where the problems are, and they start looking for solutions.

Should users be involved in planning? The respondents had few doubts.

Sterns: We insist that users be deeply involved.

Ziccardi: The information center should give users a chance to experiment. If users don't try applications on their own, they may as well write up a service request to be run through data processing's plumbing. You end up prototyping your way through systems, and although you get the information you need, you're really cheating yourself. The freedom for users to experiment is what you're paying for in an information center.

The participants' organizations serve different user communities and have been operating for different lengths of time. The products and services they offer reflect these differences and provide perhaps the most precise definitions of their designers' concepts of what a center is.

Johnson: We offer three services: consulting, training, and hot-line support. Consulting begins when a user walks into the center. Some come with specific problems, others simply ask what we have to offer. If we can identify a tool that will help them, we work out a training program. We teach them what they need to run their particular applications. Then we support them with a hot line. We

(Continued on page 108)



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Northrop, CBS Magazines

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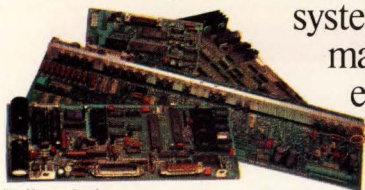
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Info Centers

(Continued from page 104)

have about 300 users right now and handle up to 30 calls on a heavy day—Fridays are usually heaviest. Many of our users are fairly new and we expect the number of calls to tail off after they become experienced.

The center runs an IBM 3081, which is part of our production system, and we use IBM PCs. On the mainframe, we run ADRS II and APL from IBM, and SAS. We're considering installing Intellect. For the PCs, we offer Lotus 1-2-3, Multi-mate, ADRS PC, and Graphwriter from Graphic Communications.

Hoy Heise: Our seven-member staff provides consultations, education, hot-line service, and general support. In fact, we call the organization a support center, not an information center. We've merged our timesharing with support for personal computing, office automation, and graphics.

Timesharing runs on an IBM 4341 dedicated to CMS with a channel attached to our production machine. We run Focus, which was developed on our machine. We chose Execucom's IFPS over Express for financial planning because of the latter's price tag. We use SAS/Graph for graphics and our executives have become very enthused about it—we can hardly make a presentation to the board of directors without graphics.

Use of the timesharing system has been increasing by 25 percent a year, compounded, so we'll be moving up to an IBM 3033 pretty quickly.

On the personal-computing side, we've limited ourselves to a handful of products that we support to the hilt. We'll help any users try anything they want with these products. The hot line is staffed from 7:30 a.m. until 5:30 p.m.—and we get calls. We have about 600 to 800 users, and they call about 3,000 times a month. Our priority now is tying everything together. We have some tinkerers on staff working on that.

Sterns: Our information center's main function is to provide internal consulting. Our main product is Express. We use Comshare's System W for financial modeling. We run an IBM 4331 and support a variety of personal computers including those from IBM, Apple, and Wang. We use a lot of software, including Lotus 1-2-3, Compu-rate 4 for freight rates and routing, and Logistek for distribution analyses.

Stutz: An IBM 3081 handles our production work. We run Focus, SAS, and Inquire on an IBM 3033. We're bringing in System W and IBM's SQL soon. For personal-computer users we support the IBM PC, TRS-80 from Tandy (Radio Shack), and Apple models.

We have a separate graphics center offering Trend-spotter (a system based on an Altos microcomputer) from Cullinet Software (Westwood, MA). Peripherals let us produce color hard copy on a laser printer or 35mm slides. We can download information from the mainframes and

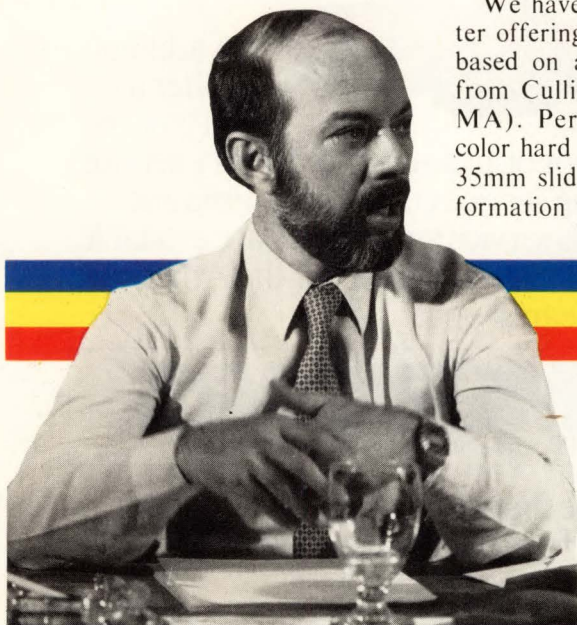
graph it automatically. We don't charge for use of the facility so it's very attractive. [Editor's note: The Trend-spotter system costs \$50,000.]

Our major product is information. We've developed software built around our corporate data dictionary that allows anyone with a personal computer or timesharing terminal to locate whatever data are available and download them. That capability is the key to our success. We've eliminated the need for the data-processing department to act as middleman and generate the code needed to tap the database. We've got about 1,200 timesharing users, but probably only half of them are really active. There are probably as many personal-computer users, whom we expect to eventually log onto the system.

Ziccardi: We provide training and consulting, and we've done a lot of data analyses to help users locate the data they need and find out how they can get them. Our only product right now is Focus. We're working on a self-study course on it for users. We looked at some of IBM's APL products, but found them a bit too rough for users to handle. We offer more variety on the personal-computing side—including Lotus 1-2-3, Easywriter, and other programs.

For security reasons, we haven't set up a direct link to the corporate database, but we hope to. Right now we're copying operational data and carrying them into the information center.

Fineran: We provide group training and video-assisted instruction, and we showcase products. We bring in

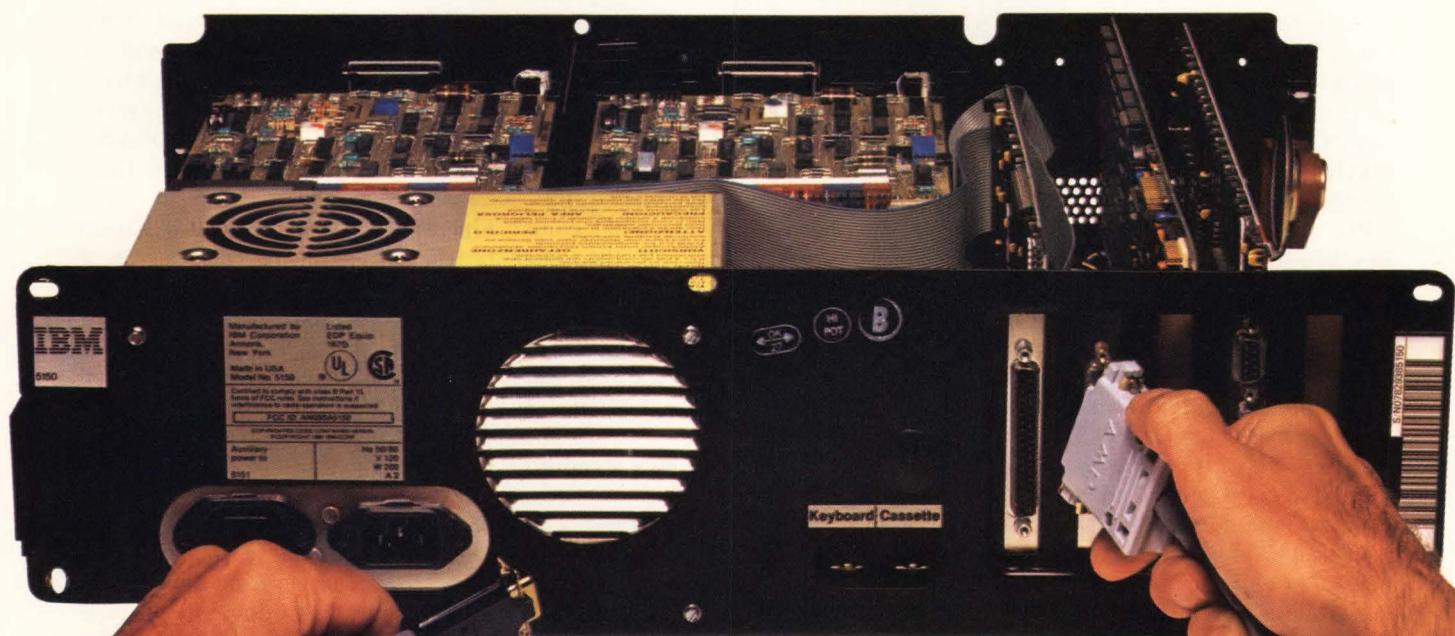


"We provide training and consulting, and we're helping users locate the data they need."

Ziccardi, European American Bank

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different kinds of personal computers and software and give users a chance to try them. We invite vendors to demonstrate their products, and we operate an electronic bulletin board and a newsletter with a circulation of 2,500.

Bordelon: We're just getting started. We have three Focus users now, and four in training. Within a month we'll have 20, and within two months we'll have 50. We've begun training employees to use Tell-A-Graf, although we're going to let only the financial employees who asked for the package use it at first. We also train our CMS users. We'll be bringing in a six-pen plotter for graphics soon. We've got a lot of activity, and it's coordinated by a staff of only two.

David Northrop: We run APL-based products on our IBM 4341—APL, APL-DI, ADRS II, ADRS/BG. We support the IBM PC almost exclusively, and have a straightforward software set—Lotus 1-2-3, Multimate, and Ashton-Tate's dBase II.

Giannantonio: Our information center runs a Burroughs 5900, offering business-planning, statistics, and database packages, and a fourth-generation language called Linc. We also use Express quite heavily, but not as an end-user tool. It's allowed our systems-development staff to de-

velop end-user applications.

We introduced personal computers about two years ago in a "creative-learning center." We brought in a micro from each manufacturer and invited all headquarters employees to come in and try them during lunch breaks and after work. We trained more than 700 employees that way. Recently, we made personal computers the information center's responsibility. It conducts two training sessions a day. And we've settled on personal computers from IBM, Eagle, Apple, and Digital Equipment Corp. Microcomputer software sanctioned by the center includes Lotus 1-2-3, PC File, dBase II, Eaglecalc (which is similar to Lotus 1-2-3), and Eaglewriter.

A key goal for us is the development of a universal workstation. We are hard-wiring personal computers to multiplexers with the logic needed to tie into our mainframes. Users call up the system and work from menus that help them gain access to the information they are authorized to use. We have about 300 of these workstations.

Tuhy: Our center provides standard training and consulting services. We publish two newsletters—one covering timesharing and the other on personal computing. We have about 2,000 users and our hot-line fields about 1,000 calls per month. The timesharing service operates on an IBM 3081. We offer SAS, Inquire, Data Analyzer, and Tell-A-Graf. We're studying Focus now. Most personal computing is done on the IBM PC with Lotus 1-2-3 and dBase II.

Information centers represent important new elements in organizations. They deal with many other segments of their companies and can significantly alter the way those groups do business. The centers often represent large investments. They require the participation and cooperation of many employees. How can the center be introduced to the organization smoothly?

Tuhy: Over six months, we made presentations to a mixed group of middle managers within the operating divisions. We hoped our information would filter up and down throughout the organization and we were apparently right. We don't have to do any marketing now because we can barely handle the employees coming through the door on their own.

Fineran: We worked with a liaison board comprising representatives of all the Department of Agriculture agencies. The board told us what direction it wanted to see us take with the information center and suggested hardware and software acquisitions. The representatives also passed information from the information center to their organizations.

Bordelon: We're setting up a similar group. We'll have at least one contact person in each operating division.

Sterns: Our introduction started with the corporate executives—the finance and marketing vice presidents and the heads of the operating divisions. They put us in touch with the operational managers most likely to benefit from the system. Once we'd sold the brass, it was easy to obtain funding because everyone



"Sometimes it's easy to cost-justify an information center based on reduced charges for outside timesharing services."

Seidman, Crwth Computer Coursewares

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or modify screens without writing one line of code. You design the screen simply by positioning fields where you desire. Then COBOL data descriptions are *automatically* generated from the screen.

UFO/COBOL makes prototyping easy.

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Developed by Oxford... #1 in CICS application development.

UFO/COBOL is a development of Oxford Software Corporation, the leading independent supplier of on-line application development software. With more than 1500 installations of UFO... the premier, 4th generation non-procedural approach to application development... no one knows more about the CICS application development environment than Oxford.

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An example of UFO/COBOL commands.

In COBOL	In Command level	In UFO/COBOL
DISPLAY (SCREEN-NAME)	EXEC CICS SEND MAP ('XDFHCMA') MAPONLY ERASE END-EXEC.	DISPLAY (SCREEN-NAME)
READ (FILE-NAME)	EXEC CICS READ DATASET ('FILE- NAME') INTO (FILE- NAME) RIDFLD (KEYNUM) END- EXEC.	READ (FILE-NAME)

environment increases enormously, while your programmers continue to write in a familiar and natural way.

UFO/COBOL defines CICS 3270 screens on-line.

In addition to extending the capabilities of your programmers, you'll find that UFO/COBOL is a powerful new method to speed-up the CICS application process dramatically. Built into UFO/COBOL is an interactive screen painting facility that lets you design CICS 3270 screens on-line. UFO/PAINT allows you to build



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☐ Please send me literature on UFO/COBOL.

Name _____

Title _____

Company _____

Address _____

City _____ Province _____

Code _____ Phone (_____) _____ CD _____

Info Centers

(Continued from page 110)

knew about the project.

Ziccardi: Contact with users must be ongoing. We've trained about 140 users, but only about 20 a day log on. That's an indication that something isn't right, and we're conducting a survey to identify the reasons. So

we're learning about our teaching methods. The first thing we learned is that, when you're covering technical information, you have to review it continually. Users are not going to admit their ignorance in front of a large audience. You have to go back

to them and hold their hands and guide them.

Bordelon: Before we opened our information center, the company provided training sessions on Focus to about 100 employees en masse. This was before the system was even up. By the time it was turned on, nobody remembered anything.

Sterns: Before beginning the technical training, the information center staff has to convince users it understands their businesses. Users don't want to talk about data processing. They will tell you what their work entails and what kind of help they'd like. We spent two or three weeks

"Users should set up their own systems because they'll learn more about the data available to them." *Feinleib, Nonprocedural Syst.*

discussing these issues with each user department before we started training.

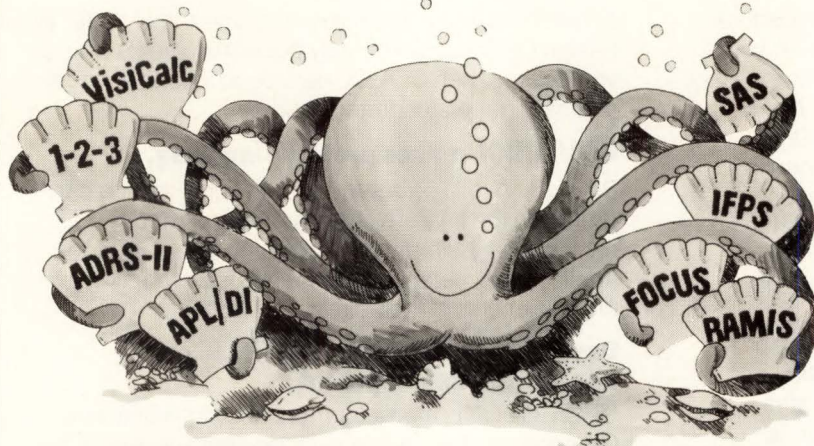
Heise: We found an aggressive individual in each department and gave him or her intensive assistance. The first time through, we'd do the job for each one of them. The next time, we'd work with them. And the third time, they'd do it themselves. These employees became apostles spreading the information center's gospel.

Stutz: The level of training and support required is constantly changing. We're finding more demand now for data-processing and programming courses, in addition to the instruction on using software tools. Users are becoming more and more sophisticated.

Fineran: The trainers may have to move slowly and demonstrate a lot of patience. They have to put a damper on the notion that users will be able to go back to their offices and begin computing after one easy lesson. If user expectations are too high, there will be frustrations.

Seidman: Many information-center managers don't realize the importance of providing users with a

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To top it off, DATAPORT is a stand-alone, full-screen entry, display, and analysis system. Its file-folder concept allows users to work with tabular data like budgets or sales forecasts and text data like memos, instructions, or reports. The DATAPORT product also provides powerful calculation routines, highlighting, report

formatting, and even works with multi-dimensional data.

Most important, DATAPORT was designed from the very beginning for the wide range of users in the Information Center environment. A unique combination of menu and command-driven technology provides a level of friendliness that satisfies the needs of both expert and novice users.

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grounding in information technology. They take for granted what they've learned as they "grew up" in data processing and fail to recognize that users don't understand much of the terminology. You have to begin by making users computer-literate. They can't begin by learning to use a package.

Heise: A center needs good teachers. We started out with technical personnel, but replaced them pretty quickly with employees who could communicate.

Tuhy: The most important trait for an information-center staffer is an understanding of the company's business.

Stutz: Our staff comes from either user departments or from the time-sharing-support group. None of them has a data-processing background. We rotate them out of the center after about 18 months and bring in new blood.

Fineran: Our center has only four

full-time employees, but we also use teachers from nearby universities as part-time instructors. We also train the trainers in the user agencies.

Has providing processing tools

"We saw computing power migrating to users. We wanted to address the issue head on."

Northrop, CBS Magazines

and training reduced the traditional data-processing backlog? Participants report mixed results. Information centers don't reduce the backlog as much as they change the types of requests submitted to dp, they assert.

Bordelon: Much of what the information center does is applications that never would have made it through the data-processing backlog. I want the

information center to provide the kinds of reports that are important to a department, not reduce the dp backlog.

Ziccardi: We justified the center on the basis that it would allow users to create applications that data processing was unable to handle. It's doing that.

Webber: But hasn't your success led to even more requests?

Ziccardi: That's what we're looking for.

Giannantonio: We've noticed one important change in user requests for system enhancements. With a traditional systems-development setup, the users would return with long lists of requests or enhancements three months after a project was completed. We gave users Express in our information center and, after the introduction, we didn't see them again for a year. When they came back, they wanted only additional

(Continued on page 210)

staff+staff+staff+staff+staff+staff+staff
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staff+staff+staff+staff+staff+staff+staff

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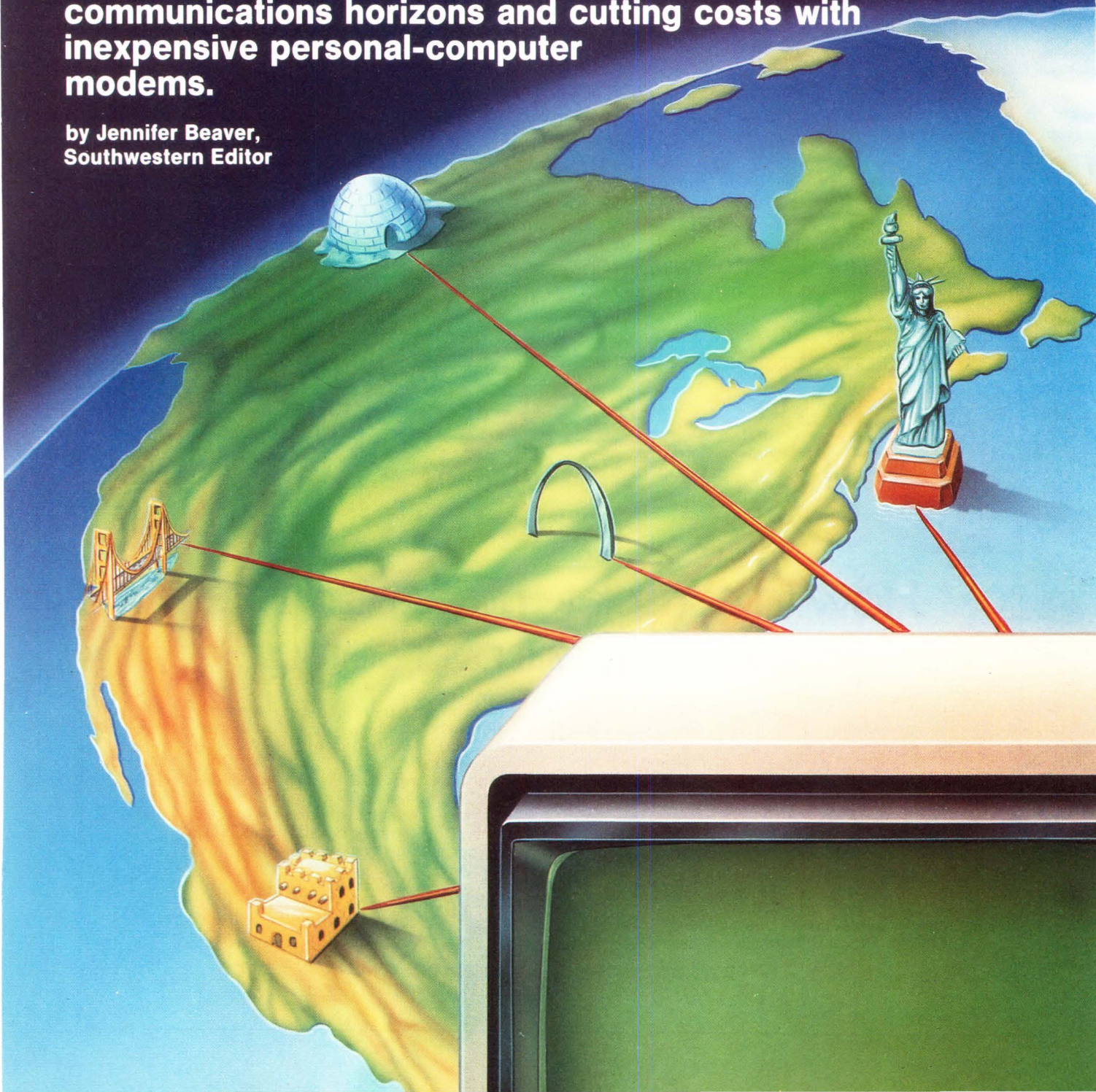
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MICRO MODEMS LET YOU REACH OUT TO THE WORLD

A wide cross-section of businesses are expanding their communications horizons and cutting costs with inexpensive personal-computer modems.

by Jennifer Beaver,
Southwestern Editor



For the personal computer, business hours don't end with the five o'clock whistle. Computers reach out to each other in the late-night hours when rates are at their lowest. Using a communications device called a modem (short for MODulator/DEModulator), these micros receive and transfer data from remote sources. While modems don't restrict their activity to the night, their ability to operate unattended, combined with their low price

range, enables savvy users to extend the business day without paying a heavy premium in overtime.

The telephone companies have learned to take advantage of low night rates for internal operations. At Pacific Bell in California, 60 IBM Personal Computers and XTs, each equipped with a Hayes Smartmodem 1200 and a Transend communications-software package, begin exchanging information after 11 p.m.

To carry out tasks

automatically, modems need a certain amount of built-in intelligence. Ron Wheeler, director of Pacific Bell's technical assessment and planning in San Francisco, chose the Smartmodem 1200 because it dials, answers, and disconnects by itself. When Wheeler comes to work in the morning, his mail is already in his in-box on the screen. This method is faster and more reliable than any of the overnight delivery services.

A special need for communications software that would allow users to send editable documents led Wheeler to Transend. "Some of our file transfers require input from people on the other end," he explains. "Now we can trade information until the

Illustration by Jack Moore



Micro Modems

(Continued from page 115)

document is acceptable to all parties."

This arrangement helped Pacific Bell set up a fiberoptic network in Los Angeles for the 1984 Olympics (which begin next month). When a company official went to Washington to consult with the Federal Communications Commission (FCC), he received up-to-the-minute data from

San Francisco using his Compaq portable computer and a modem.

Bell's nocturnal office-automation network provides great administrative relief for the engineers and their secretaries. Other document-intensive companies might consider Supertex PC from American Datacom. The \$695 package, including word-processing software and an

internal modem, turns an IBM Personal Computer or PC-compatible into an advanced word-processing telecommunications system.

Modems expand the range of micros for traditional applications such as Pacific Bell's office-automation network. They can also present lucrative opportunities. "Personal-computer users have reached the point

Personal-computer modems

Vendor	Product	Speed (in bps)	Requirements	Price	Circle
American Datacom (714) 863-3000	Supertex PC (I)	600	IBM PC or compatible	\$695*	657
Anchor Automation (213) 997-6493	Volksmodem	300	RS-232C port	\$80	658
	Signalman Mark IL	300	Same	\$99	
	Signalman Mark VII	300	Same	\$159	
	Signalman Mark XII	300 or 1,200	Same	\$399	
Anderson Jacobson (408) 945-9030	AJ 1212 ST	300/1,200	RS-232C port	\$495	659
	AJ 1212 AD1	300/1,200	Same	\$595	
	AJ 1212 AD2	300/1,200	Same	\$695	
Apple Computer (408) 996-1010	Apple Modem 300	110/300	Apple II, III, Macintosh, Lisa	\$299	660
	Apple Modem 1200	300/1,200	Same	\$495	
Bizcomp (408) 745-1616	PC: Intellimodem (I)	110/300	IBM PC or compatible	\$499*	661
	1012	1,200	RS-232C port	\$549	
	1022	300	Same	\$249	
Cernetek Microelectronics (408) 734-8150	Info-Mate 212 A	300/1,200	RS-232C port	\$595	662
	Info-Mate 212 PC	300/1,200	IBM PC or compatible	\$495*	
Code-A-Phone (503) 655-8940	Tel-A-Modem	300/1,200	RS-232C port	\$695	685
ComData (312) 470-9600	305E2-12	300	RS-232C port	\$97	663
	370E2-12	300	Same	\$207	
	370E2-42	300	Same	\$217	
	212E2-12	1,200	Same	\$297	
	P 212A	300/1,200	Same	\$537	
Datec (919) 929-2135	Pal 103	300	Any micro with RS-232C port	\$195	664
	Pal 212	300/1,200	Same	\$495	
	Pal Plus (I)	300/1,200	IBM PC or compatible	\$599	
DEC (617) 897-5111	DF104	150/2,400	Any micro with RS-232C port	\$695	665
	DF112	1,200	Same	\$745	
	DF126	2,400	Same plus a leased- line	\$895	
	DF127	4,800	Same	\$2,045	
	DF129	9,600	Same	\$3,045	
	All DEC modems also available in rack-mount version				

(I): Integral modem *Includes software

The New Rixon Intelligent R212A Modem...

The Intelligent R212A has literally leap-frogged the competition and revolutionized the 212A modem market. All beta site customers report that the Intelligent R212A is the most amazing 1200 BPS full duplex modem with an integral automatic dialer they have ever seen. Installation is the simplest of any modem ever because all options are soft (programmed from the keyboard)—no screw drivers or tools required, just plug it in.

The Intelligent R212A features:

- Automatic log on to databases with a single key stroke
- User friendly HELP list menu
- Store up to 10 numbers and alpha descriptions
- Automatically sets parity
- Automatically selects tone or pulse dial
- Dial stored numbers with a single key stroke or other numbers from the keyboard



- Initiate modem tests from the keyboard and review results on the CRT screen
- Battery backup protects all memory
- Link to another number if first number busy
- Redial selected numbers 1 to 99 times
- An unprecedented low price of \$499.00

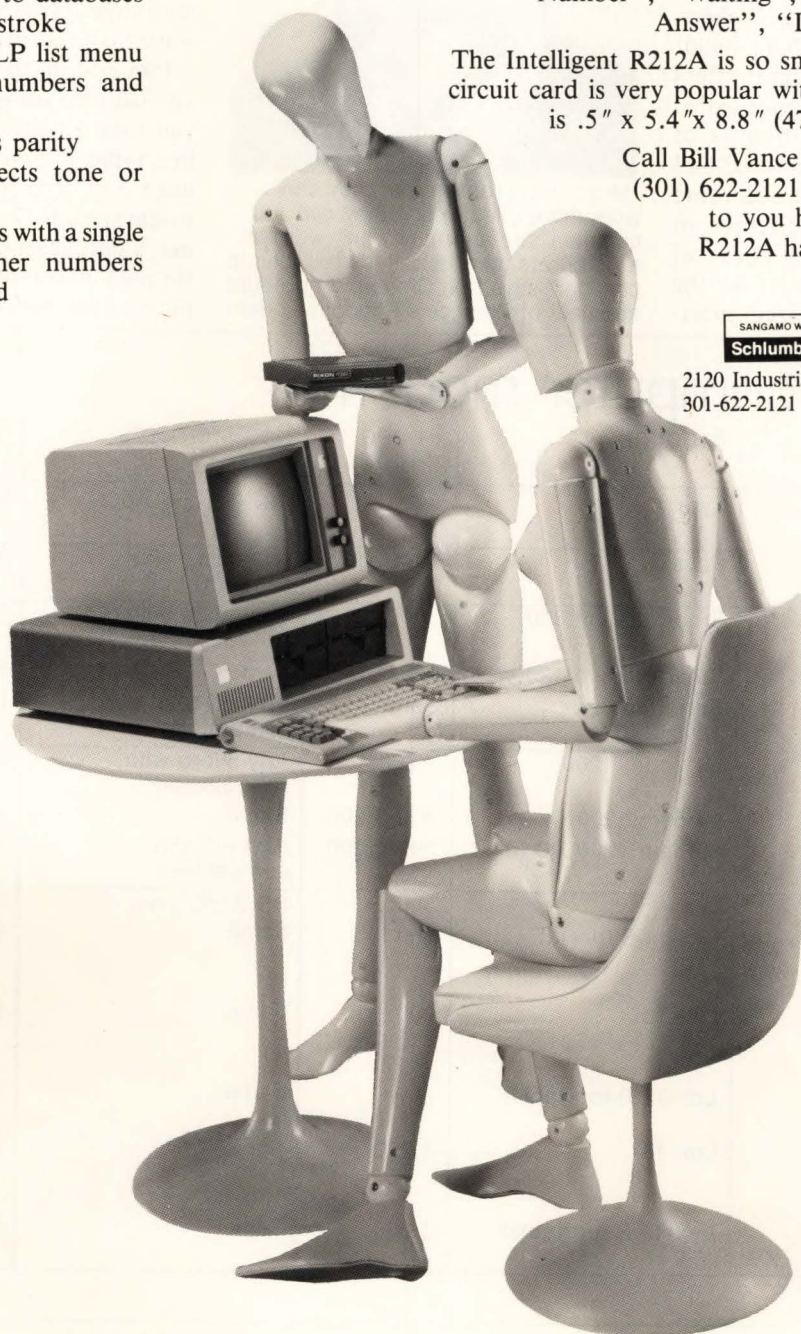
The Intelligent R212A continuously monitors the progress of each call and reports its status by displaying — "Dialing Number", "Waiting", "Ringing", "Busy", "No Answer", "Linking" and "On Line".

The Intelligent R212A is so small it stands to reason the circuit card is very popular with OEM's. The OEM card is .5" x 5.4" x 8.8" (47 sq. inches).

Call Bill Vance today, at RIXON Inc., at (301) 622-2121, ext. 431. Bill can explain to you how the RIXON Intelligent R212A has revolutionized the 212A modem market.

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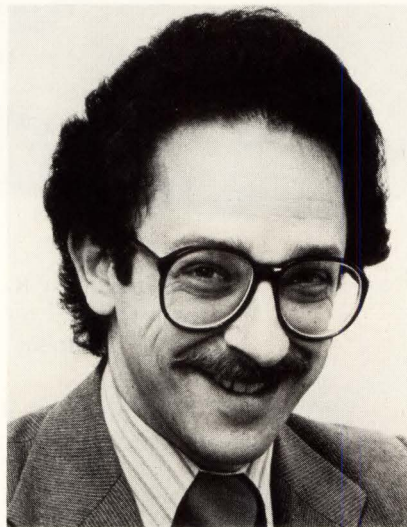
Micro Modems

(Continued from page 116)

where they want to push their machines to the limit—and that means expanding into communications,” comments Pete Moulton, an information-technology consultant based in Columbia, MD.

The First Boston Group has followed this route. Though primarily known as an investment-banking firm, one of its wholly owned subsidiaries, First Boston Capital Group, is making a name for itself as one of the nation's leading mortgage brokers.

From its Tarrytown, NY, headquarters, First Boston Capital offers a mortgage-origination service called Shelternet. After nine months of operation, the system generated \$14 billion worth of mortgages, according to William L. O'Neil, director of microcomputing. The success of Shelternet, which claims to be the country's only computerized mort-



“Micro users reason that they can work more effectively if they can communicate and they won't wait for a corporate manifesto if it's too long in coming,” says Ken Cretchmur, product architect of Prentice's Popcom modem.

gage-origination system, would not have been possible without modems and personal computers.

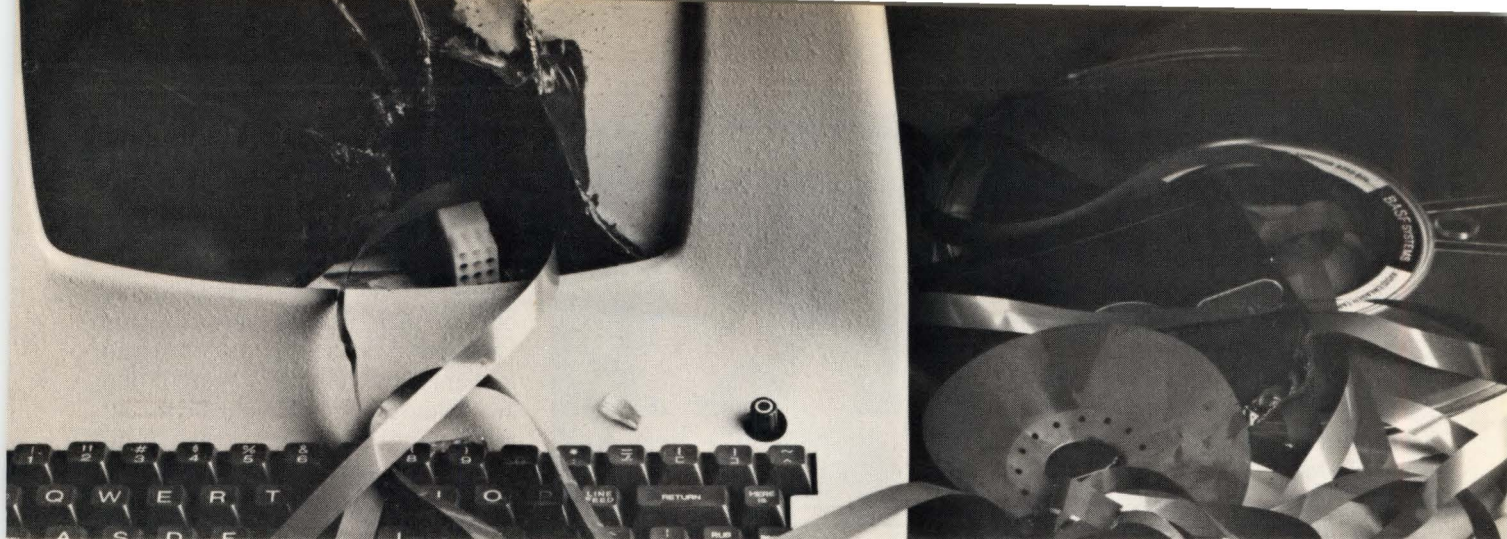
Three hundred participating realtors buy or lease IBM PCs or Compaqs from First Boston Capital. Using the PC:Intellimodem (an internal modem from Bizcomp), these micros communicate with an IBM 4341 in Tarrytown over Tymnet, the public packet-switching network.

The confusing array of available mortgages plus the mounds of paperwork involved in a traditional transaction add up to a perfect computer application, according to O'Neil. “If you took all the paperwork involved in a typical 25-year, fixed-rate mortgage and laid it out end-to-end, it would stretch 27 miles. With Shelternet, a purchaser doesn't have to wade through paper or wait for letters or phone calls to find out where his or

Personal-computer modems

Vendor	Product	Speed (in bps)	Requirements	Price	Circle
Emtrol (717) 291-1116	Lynx	300	TRS-80 and Apple	\$299	666
Envax Syst. (214) 986-1151	Envax	50-1,200	Any micro with RS-232C port	\$1,196	686
Hayes Microcomputer (404) 449-8791	Smartmodem 300	300	Any micro with RS-232C port	\$289	667
	Smartmodem 1200	300/1,200	Same	\$699	
	Smartmodem 1200 B (I)	Same	IBM PC and compatibles	\$539	
Kensington Microware (212) 475-5200	Datacom 1200	1,200	Any micro with RS-232C port	\$399	668
	Modem 1200	300/1,200	Same	\$595	
	Modem 1200 PC (I)	300/1,200	IBM PC and compatibles	\$595*	
Lexicon (305) 792-4400	Lex-11	300	RS-232C port	\$160	669
	Lex-11 B (portable)	300	Same	\$199	
	Lex-12	300	Same	\$180	
	Lex-12 B (portable)	300	Same	\$220	
	Lex-15	1,200	Same	\$329	
	Lex-15 B (portable)	1,200	Same	\$400	

(I): Integral modem *Includes software



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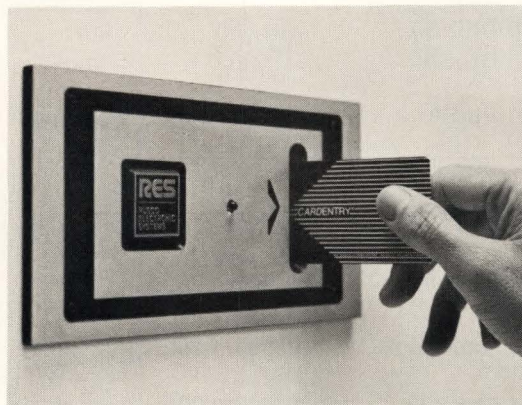
utilizes compact CARDENTRY readers. You tell your system who's allowed in and when. Then, if an unauthorized person tries to enter the facility the door won't open.

What's more, the RES CARDENTRY system tells your security guard where and when an unauthorized entry has been attempted - in easy-to-read English text.

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So if your computer isn't already protected by our system, it should be. After all, do you know who's using it right now?



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Micro Modems

(Continued from page 118)

her mortgage stands—the realtor simply looks it up on the computer. The average closing time shrinks from three months to three weeks.”

O’Neil considered using Hayes Smartmodems, but found they ran hot after several hours of operation—a drawback that could lead to equipment failure. A few months ago, he switched from the Bizcomp 1012 stand-alone modem to the internal model for a simple reason most busi-



ness executives can appreciate: It minimized desk clutter.

“People whose jobs depend on the

telephone don’t want to put another box on their desks,” says Bizcomp President Michael Eaton, “Internal modems also simplify installation and maintenance. About 90 percent of our service calls are a result of incorrectly wired external modems.”

Steve Durham, marketing vice president of Cermetek, another modem manufacturer, agrees with this concept. “When you hook up a

(Continued on page 124)

Personal-computer modems

Vendor	Product	Speed (in bps)	Requirements	Price	Circle
MJF Enterprises (601) 323-5869	MFJ-1233	300	Any micro with RS-232C port	\$130	670
Microm Syst. (213) 998-8844	M3012	300/1,200	Any micro with RS-232C port	\$495	671
	M3012 Plus	300/1,200	Same	\$595	
	M3012 Plus T	300/1,200	Same	\$695	
	M3024	1,200/ 2,400	Same	\$795	
	M3024 Plus	Same	Same	\$895	
Multi-Tech Syst. (612) 631-3550	Multi-Modem HC	300/1,200	Any micro with RS-232C port	\$549	672
	Multi-Modem PC (I)	300/1,200	IBM PC or compatible	\$549	
NEC Home Electronics (312) 228-5900	Authentic 300 MD	300	Any micro with RS-232C port	\$80	673
Novation (213) 996-5060	Apple-Cat II (I)	300/1,200	Any Apple model	\$389	674
	Smart-Cat 103/212	300/1,200	Any micro with RS-232C port	\$595	
	212 Auto-Cat	300/1,200	Same	\$249	
	PC-Cat (I)	300/1,200	IBM PC	\$595	
Penril Datacomm (415) 490-2370	300/1200 SA	Same	Any micro with RS-232C port	\$525	675
	1800 DED SA	1,800	Same	\$375	
	8201 DN SA	1,200/ 2,400	Same	\$795	
	8201 PL SA	300/1,200	Same with leased line	\$785	
Prometheus Products (415) 490-2370	Pro-modem 1200	300/1,200	Any micro with RS-232C port	\$495	676
Racal-Vadic (408) 744-0810	VA212PA	300/1,200	Any micro with RS-232C port	\$695	677
	IBM PC Modem	300/1,200	IBM PC	\$599*	
Rixon (301) 622-2121	PC212A (I)	300/1,200	IBM PC	\$499*	678
	R212 Intelligent Modem	300/1,200	Any micro with RS-232C port	\$499	
	Executive 212	300/1,200	Same	\$599	
Teletone (206) 827-9626	Teleport 300	75/9,600	Any micro with RS-232C port	\$399	752

(I): Integral modem *Includes software



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development:**

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forever or cost the earth.**

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Your immediate benefit is you can achieve your new system with savings in time and expense as great as fifty percent of that needed to write an entirely new system. Only Peat Marwick's Structured Retrofit can do this. And you gain the long-term advantage of a major reduction in maintenance programming costs.

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The advantages of a portable computer.

Personal computers.

No matter where you are or what you do, you can see how they're changing your world. If you've done any reading on the subject, you know that there are a dizzying array of personal computers on the market today, all with differing features, capabilities, sizes, and prices.

If you're planning to buy a personal computer, consider the advantages of a portable computer. Today, the portable computer can offer the same capabilities as a desk-top model, yet give you options that go far beyond your desk: If you work at home, a portable can free you of the cost of separate computers for your home and office. A portable computer can make any business trip infinitely more productive. And outside the office, a portable can also become an educational tool for your family.

The benefits of a portable computer go as far as you can take it.

Weigh the differences.

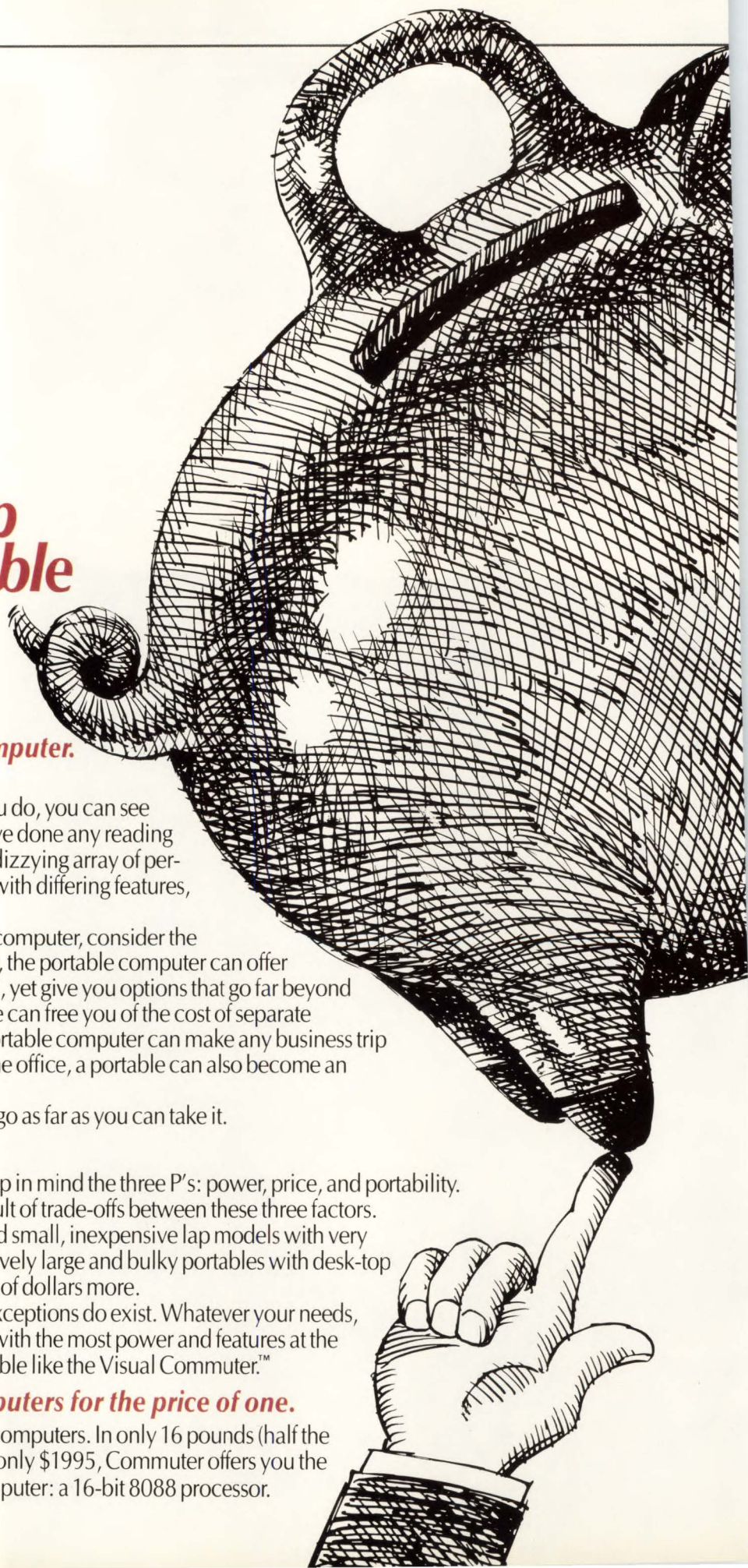
When looking at portable computers, keep in mind the three P's: power, price, and portability. Every portable computer design is the result of trade-offs between these three factors.

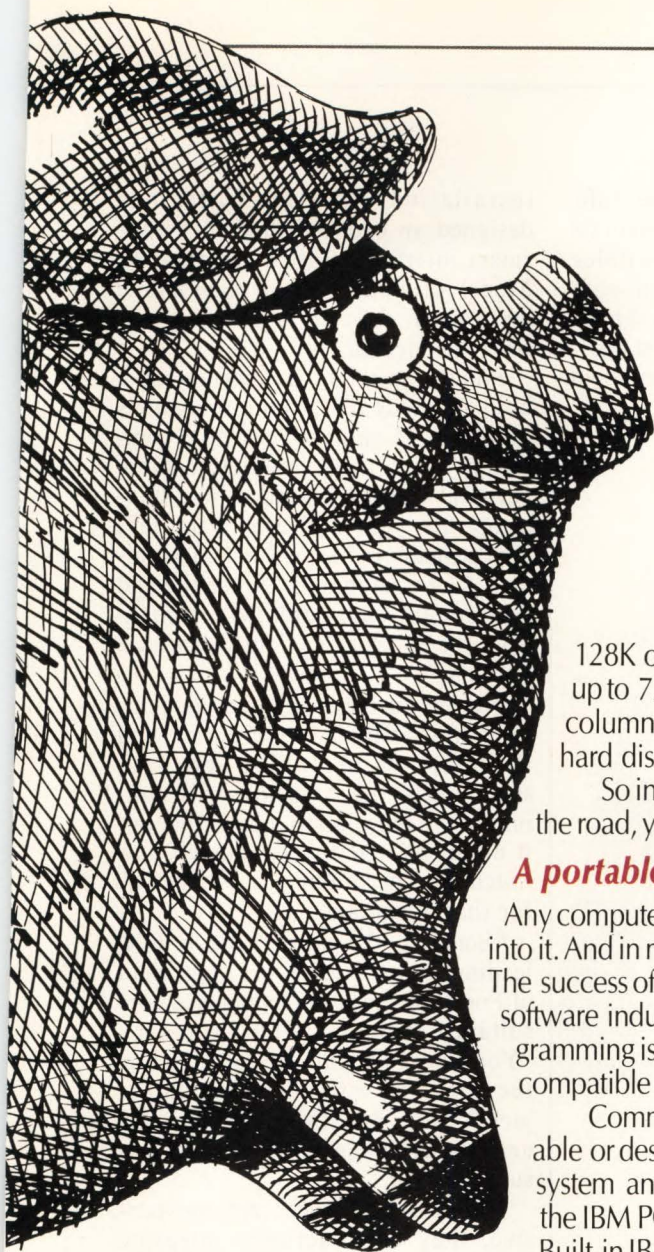
At one end of the spectrum you'll find small, inexpensive lap models with very limited capabilities, and at the other, relatively large and bulky portables with desk-top computer power, costing up to thousands of dollars more.

Within this broad range, however, exceptions do exist. Whatever your needs, remember: you're looking for the model with the most power and features at the lowest possible weight and price. A portable like the Visual Commuter.™

The Visual Commuter: two computers for the price of one.

Commuter is a breakthrough in portable computers. In only 16 pounds (half the weight of comparable portables), and for only \$1995, Commuter offers you the same features as a powerful desk-top computer: a 16-bit 8088 processor.





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No computer makes \$1995 go farther.

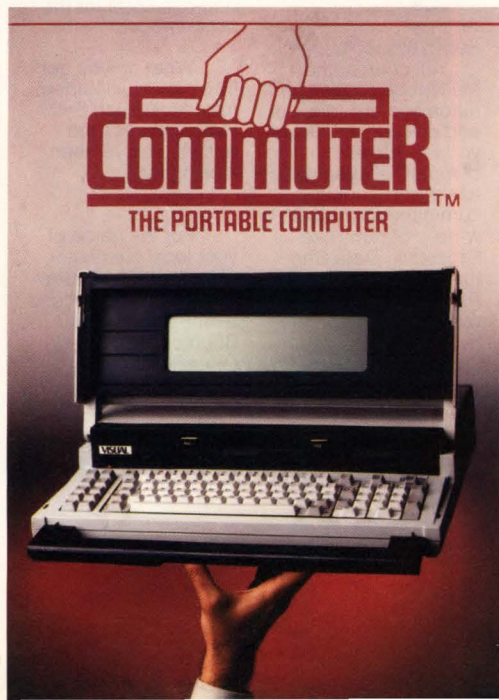
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Commuter. It can take your business places it's never been.

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Micro Modems

(Continued from page 120)

modem, you have option switches on both the modem and the personal computer. Unless you're familiar with serial lines, you'll run into trouble. Because internal modems draw power from the host computer, they also eliminate one more costly power

supply." Cermetek offers the InfoMate 212 PC, an internal modem for IBM PCs, XTs, and compatibles. Bundled with a communications-software package, it costs \$495 and has a variable speed of 300 to 1,200 bps.

In response to the confusion about

installation, Prentice Corp. has designed an external modem with a smart interface. Called the Popcom Model X100, the modem plays a tune when each of the three cables is correctly connected.

Should you buy a micro with a built-in modem? "Communications devices have outpaced personal computers with the result that some personal-computer vendors are shipping this year's micros with last year's modems," says Popcom architect, Ken Cretchmur. "Since the end user doesn't want outdated merchandise, the internal modem becomes a liability."

Newer business-oriented modems like those offered by Prentice and Bizcomp feature voice and data switching on the same line. This eliminates one more costly phone line but it might be wise to ask yourself how much of a premium you should pay for that advantage.

"Some of the advertising is misleading," says Fred Stern, president of Fourth Generation Systems, a consultancy that also offers seminars. "You can easily put voice and data on the same line with a low-cost duplex jack." Such devices cost under \$20 and are available at most electrical-supply shops.

While these devices are inexpensive, they don't actually integrate voice and data. With a duplex jack, you must know the exact second the modem is finished transferring data in order to switch successfully to voice; otherwise, the modem will disconnect the line.

Bizcomp's sensor can detect the end of data transmission automatically. And without operator intervention, the Popcom turns off the data when voice comes on, negating the need for a special command that users tend to forget to use.

If you've smashed up your car and need an estimate in a hurry, you'll be relieved to know ADP Collision Estimating Services can help your adjuster determine the cost of repairs four times faster than before. The company recently upgraded from 300-bps

(Continued on page 128)

What do you get when you cross 1200 baud, free on-line time, and extra features at a price Hayes can't match?

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The MultiModem gives you a choice—either 1200 or 300 bits per second. So you can go on-line with the information utilities. Check out bulletin boards. Dial into corporate mainframes. Swap files with friends.

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Features & Price?

Of course, the MultiModem gives you automatic dial, answer, and disconnect. Gives you the Hayes-compatibility you need to support popular communications software programs like Crosstalk, Data Capture, our own MultiCom PC, and dozens of others. Gives you a two-year warranty, tops in the industry.

MultiModem.

But Better?

Yes. The MultiModem gives you features the Hayes Smartmodem 1200™ can't match. Features like dial-tone and busy-signal detection for more accurate dialing and redialing. Like a battery-backed memory for six phone numbers. All at a retail price of just \$549—compared to \$699 for the Smartmodem.

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For the name of your local distributor, write **Multi-Tech Systems, Inc.**, 82 Second Avenue S.E., New Brighton, MN 55112. Or call us at (612) 631-3550.

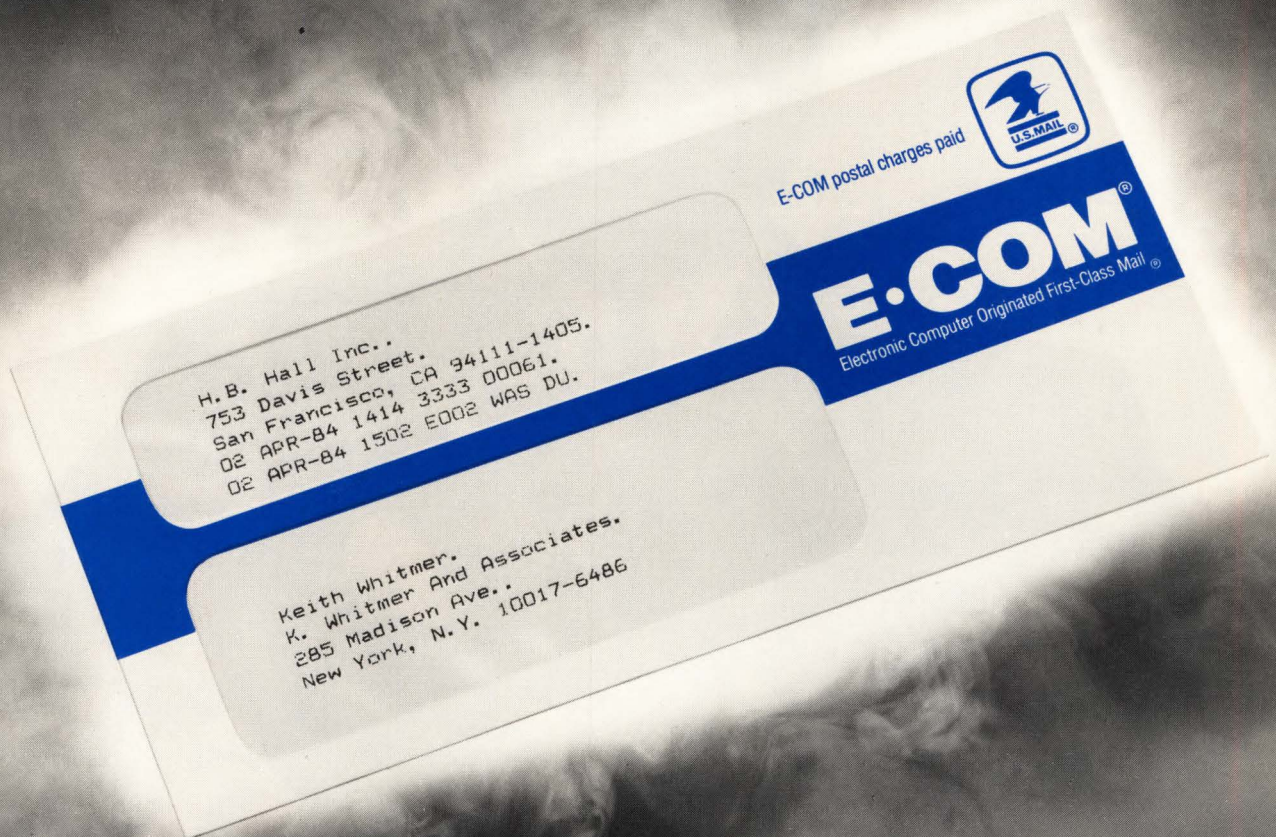


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Multimate

We're putting our reputation into words.

Micro Modems

(Continued from page 124)

devices to Bizcomp 1012 modems operating at 1,200 bps.

One branch of ADP gave 300 dealers Bizcomp 1012 modems and Zenith Z90 personal computers so they could communicate with an Amdahl V-6 in Ann Arbor, MI. ADP's Audatex service can provide a written estimate of repairs, complete with labor times, charges, part numbers, and estimated retail price—all in a minute and a half.

The standard speed for most business modems is 1,200 bps. At 120



characters per second, an average page of text takes about 12 seconds to receive or transmit. Until recently, modems operating at higher speeds required expensive leased lines.

While not yet widely used, faster modems designed specifically for dialup lines are appearing. The faster your data are sent and received, the lower your phone bill. The Micom 3024, for example, operates at 2,400 bps.

Many business people eagerly welcomed portable computers because they could travel to out-of-the-way sites yet still collect data on operations. Without a modem, however, a portable is little more than a glorified notepad.

(Continued on page 213)

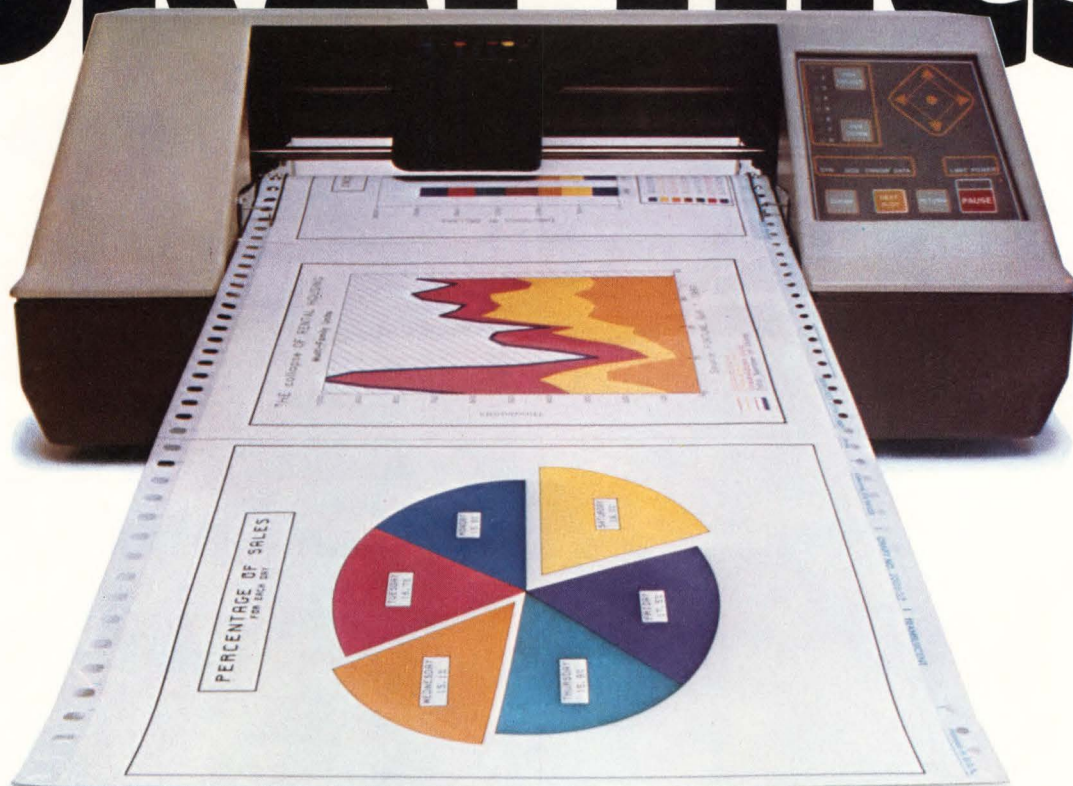
Personal-computer modems

Vendor	Product	Speed (in bps)	Requirements	Price	Circle
Transend (408) 946-7400	PC Modem Card 300 (I)	110/300	IBM PC	\$349*	679
	PC Modem Card 1200 (I)	110/300 1,200	Same	\$549*	
	Transmodem 1200	110/300 1,200	Same	\$695*	
	Modem Card 110/300	110/300	Apple II, Ile	\$325	
	Transmodem 1200	110/300/ 1,200	Same	\$695	
Tri-Data (415) 969-3700	Oz Guardian 1200	1,200	Any micro with RS-232C port	\$750	680
Universal Data Syst. (205) 837-8100	103 O/A	300	Any micro with RS-232C port	\$145	681
	103J	300	Same	\$195	
	108	300	Same	\$295	
	202 LP	1,200	Same	\$195	
	202T	1,800	Same	\$495	
	202S	1,200	Same	\$550	
	202S 5	1,200	Same	\$550	
	212 LP	1,200	Same	\$445	
	212A	300/1,200	Same	\$595	
U.S. Robotics (312) 733-0497	212 A D	Same	Same	\$645	682
	Auto Dial 212A	300/1,200	Any micro with RS-232C port	\$599	
	Auto Link 212A	300/1,200	Same	\$549	
	Auto Link 1200	1,200	Same	\$449	
	Auto Link 300	300	Same	\$269	
	Micro Link 300	300	Same	\$239	
Ven-Tel (408) 727-5721	Password	300/1,200	Same	\$449	683
	PC Modem Half Card	300/1,200	IBM PC and compatibles	\$549*	
	PC Modem 1200 (I)	Same	Same	\$499*	
	HP 150 Internal	Same	HP 150	\$425	
	1200 Plus	Same	Any micro with RS-232C port	\$499	

(I): Integral modem *Includes software

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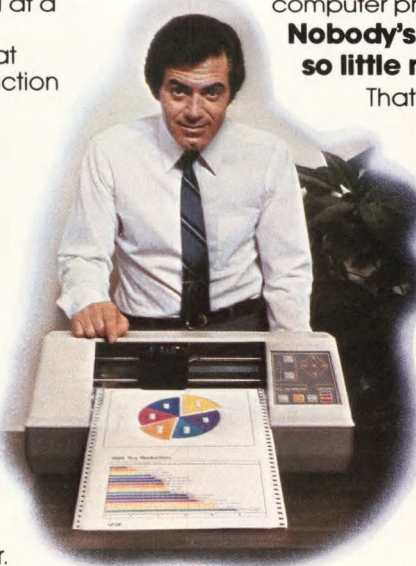
Let's face it, most reports and presentations get done in a rush. That's why we've designed a system that goes at high speed (20 inches per second). But here's the kicker. Other plotters keep their pens off to one side so every time there's a color change the plotter grinds to a halt. Top speed drops to zero. We've put all eight pens on one carriage so the plotter never has to stop.

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WHEN YOU HAVE TO PLAY THE S.O.B.

Sometimes, a work scenario will demand that you play the "bad guy." It's not a pleasant role, but somebody has to take the part.

by Martin Lasden, Western Editor

You may always root for the good guys, but it's the real nasty ones you always remember. Granted, scoundrels are not the sort you'd want to live with or work for, but characters like Dracula, Darth Vader, and Scrooge do have a certain appeal. These are the kinds of people to whom you never have to say you're sorry; whom you may detest without reservation, abhor without guilt. Isn't that what the ogres, rascals, and louts of the world have to offer us? Aren't they the sort of people you love to hate?

The "scoundrels" among us not only engender resentment, but also a sense of awe, if only because they seem oblivious to the scorn they provoke in others. They're just not interested in winning nice-guy-of-the-month awards. All they *are* interested in is getting results, and if they are perceived as mean and nasty because of it, they don't care. It is this clarity of purpose, this integrity of spirit, from which legends are made.

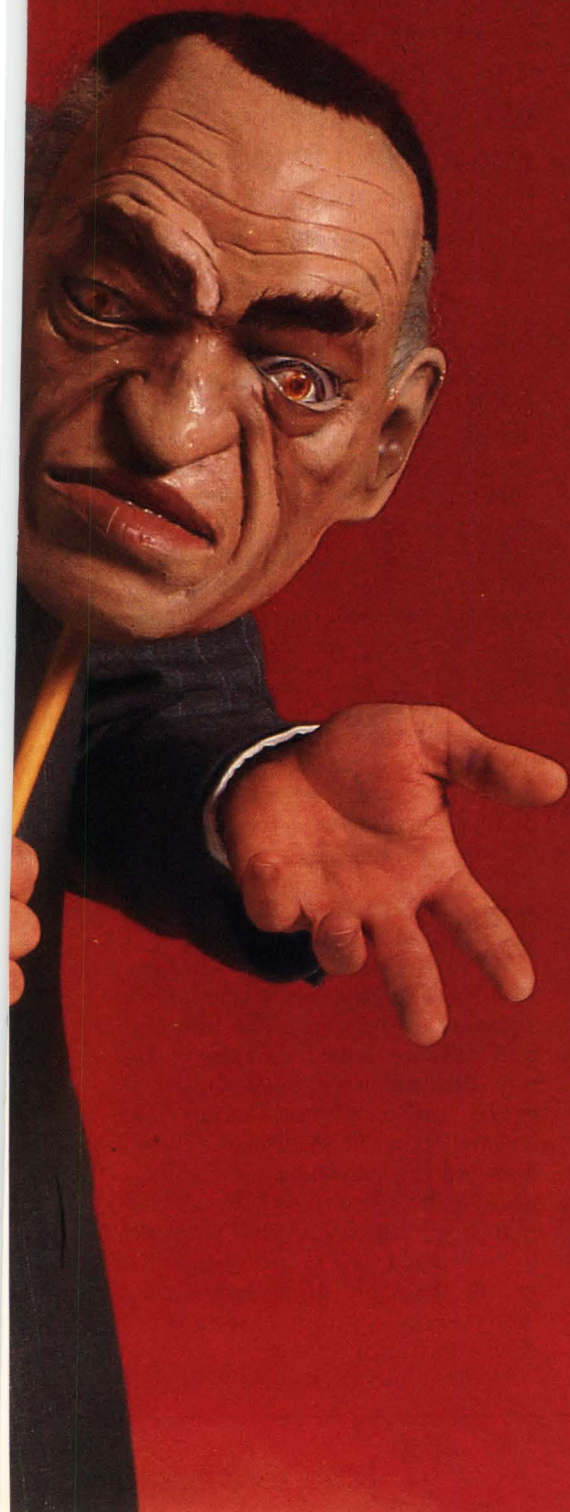
Legends like Harold S. Geneen, for example, the hard-nosed executive who ruled ITT with an iron fist for two decades. It is said that Geneen directed mass firings and made late-night calls to employees over trivial matters. A Geneen aide once observed: "If you offered him an opinion based on feeling, you were dead." Geneen seemed interested only in "unshakeable facts."

Most of us, of course, crave kind words and appreciative smiles too much to be uncaring about a subordinate's feelings. We want to be liked as well as respected. And with such concerns, we become ill-equipped to play the part of a scoundrel. We'd rather be nice guys than risk the sort of wrath created by an unpopular decision.

But here's the rub: There are times when conditions demand we make decisions that will hurt, anger, or alienate. Decisions that will make us look like bad guys. And for most of us, making and following through on these decisions isn't easy.

If your ambition has brought you into a position of power, then sooner or later, you'll be forced to make such a decision. It could involve firing, laying off, demoting, or taking away valued privileges. It could mean issuing regulations that will boost productivity at the cost of certain freedoms. To update an old cliché: "A person's gotta do what a person's gotta do." However, one variable of execution deserves some attention, and that is style—the manner, form, and context in which offensive moves are made.

Consider: Should you plunge in and get the distasteful



(Continued from page 131)

chores over with as soon as possible, or should you proceed with caution, looking for just the right time and place to spread your bad tidings? There's also the matter of extended discussion. Should your decision be presented as a fait accompli, or should you provide an opportunity for feedback and appeal from those who will be hurt most? And finally, how much of your personal feelings should be interjected into the process? Is it okay to say: "Charlie, I want you to know that I really feel bad about this?" Or does professionalism demand that you keep a stiff upper lip? How you answer these questions of style will determine not only how long it will take for the distressing after-shocks of an unpopular decision to fade away, but also how long it will take before you can be a "nice guy" again.

November 10, 1982 was a day that "nice guy" George Danforth, a corporate computer-network manager at FMC Corp., will never forget. That was the day he and his boss Gene Bedell informed 40 systems analysts and programmers, individually, that the Chicago-based company's Indianapolis data center would close. Some would be offered the opportunity to transfer; others would be laid off.

Danforth says it was the worst day of his 15-year career: He remembers getting into the office at seven in the morning and not leaving till eight at night. He remembers both men and women breaking down and crying. One of them looked Danforth straight in the eye and said: "I thought you were on our side." A fellow who was offered a transfer but refused to go warned: "You can't survive without me."

"There's a lot to be said for being a manager," Danforth concedes. "When it's good it's real good. You get to watch people grow and that's very rewarding. But when you have to sit down with people who have strongly supported you for years, who are definitely not marginal performers, and tell them there's no place in the organization for them, well... I just hope I never have to go

through something like that again."

There's just no way Danforth could have won any popularity contests that day. Without new jobs to give, all he could offer was his concern and his sympathies. And that hardly sounds like much.

But it's more than you might think. The value to employees of knowing that their misfortune had nothing to do with performance, that they really *were* appreciated, and that the boss wanted to keep them, should not be underestimated. It's not like getting a new job, but it's awfully good to know when you have to go out and find one. The problem is, a lot of bosses aren't very communicative in such situations. Subtle guilt feelings have a way of clamping them up. And too, standards of propriety may work against their expressing themselves.

It is in this regard that Kathleen Cook, vice president of MIS at Woolworth's Inc., believes she might have an advantage. As a woman, says Cook, she does not feel compelled to look cool or macho. It is a trait, she says, that served her well when Woolco, a subsidiary of Woolworth's, went out of business a couple of years ago. That event caused the shutdown of a

New York-based data center, and the layoffs of some 160 employees.

"Surprisingly," Cook says, "I was able to convince most of those laid off that it had nothing to do with them personally. In fact, as we let people go, the staff would hold departure parties to which I would be invited."

"I think it made a difference that I didn't try to play the tough guy,"

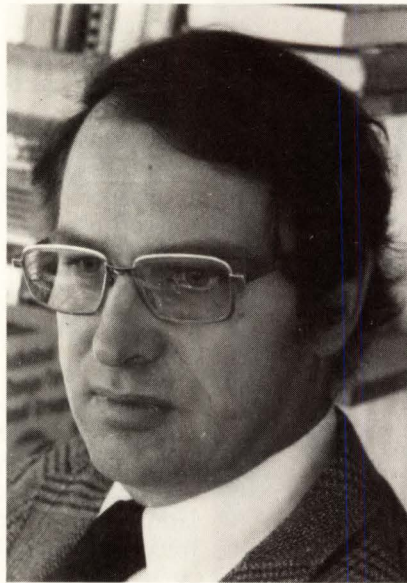
The value to employees of knowing termination was not performance-related should not be underestimated.

Cook continues. "I mean, some employees had put 20 years into this company and I felt free to tell them how badly I felt. Other managers weren't quite as open. They pretty much stuck to the facts. Maybe they didn't want to express themselves because they were afraid of losing control. In any event, I know some people left here feeling they were handled in a cold, unemotional way, and I don't think that was true for the ones I had to lay off."

Whether or not it's handled well, there's one aspect to laying off or firing employees that makes it easier to live with: Once it's done, it's done, and you won't ever have to see the victims again. This is not the case with other kinds of unpopular decisions. Some decisions leave employees wounded but still in the fold.

Robert Alloway, a Lexington, MA-based consultant and research associate at the Center for Information Systems Research (Massachusetts Institute of Technology), stresses the need for understanding, from an intellectual point of view. To understand the legitimate reasons for a decision, he insists, is to know at least that the process is fair, that the game is not rigged. To spend time cultivating that sort of understanding both ensures long-term peace and defuses short-term tensions.

However, when dealing with hu-



"Successful managers see their decisions not as finite products, but as ongoing creations," says By Barnes, a professor at Harvard University's graduate school of business.

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(Continued from page 132)

man beings, some matters go beyond understanding—like the loss of power, prestige, freedom, and self-confidence. These are matters not only of the mind, but also of the heart, and the manager who forgets this is likely to get in trouble.

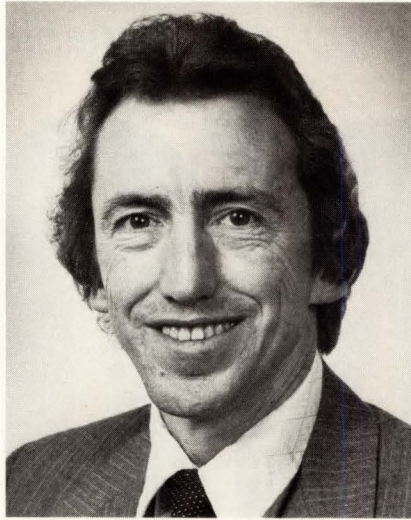
"You walk a fine line," observes Irwin Sitkin, vice president of MIS at Aetna Life and Casualty Co. in Hartford, CT. "You make a decision, and you want subordinates to accept it. On the other hand, you pay employees to be persistent. You don't want to beat them down so much that they'll never be creative again."

Sitkin has in mind an incident in which several staff members put considerable time and effort into a proposal to purchase technology he ultimately rejected. Their arguments were sound, Sitkin allows, "but I wasn't prepared to spend \$400,000 on the technology. I felt if we waited awhile, a better, cheaper solution would come along. . . . Well, that caused some of my people to get upset," Sitkin adds, "and to deal with it, I tried to couch my rejection in positive terms. I told them that they gave a fine presentation, and that I understood what they were saying. I also tried to give as clear an explanation as possible for my decision. But the bottom line is that you've got to get people to move on."

It is, no doubt, the hope of all

Should an unpopular decision be presented as a *fait accompli*, or should you provide the chance for feedback?

unpopular-decision makers to remove the wounded from old battlefields and get them onto new ones. But getting battle-scarred employees to that point is easier said than done. The stages the defeated often go through are not unlike the stages mourners go through with the death of a loved one. There's the initial shock, then sadness, then anger. If acceptance



On November 10, 1982, George Danforth, a dp manager at FMC Corp., told some 40 systems analysts and programmers that a company data center was being closed. "I just hope I never have to go through anything like that again," he says.

comes, it comes only at the end.

Linda Philipps, MIS director for the Admiral division of Magic Chef Inc. (Schaumburg, IL), found herself in this kind of predicament with some employees. She says she probably should have fired the rebellious subordinates sooner than she did. But she waited six months after initiating a rather dramatic plan to save the company money by replacing IBM mainframes with Prime minicomputers.

It was 1979, and back then, an idea on the scale Philipps was proposing was virtually unheard of. There were those who, from a technical standpoint, said it couldn't be done. And there were those who, from a political standpoint, didn't want it to be done. Nevertheless, Philipps pushed on, winning the support of top management for what turned out to be a knock-down, drag-out fight with peers and subordinates.

It was particularly tough at Admiral's data center in Galesburg, a town 200 miles southwest of company headquarters. Through the years, that center had enjoyed considerable autonomy and a virtual monopoly on computer power in support of Admiral's manufacturing plant. Philipps changed that dramatically, first of

all, by having the center's managers report directly to her. Then she canceled an order for a large mainframe for the center.

Needless to say, these actions hardly endeared Philipps to the folks at Galesburg. "No doubt about it," she acknowledges, "I was seen as a real bad guy. And people were testy about it for over a year. Anytime something went wrong, there was a confrontation. It was always the same story: We should have stayed with IBM."

Were Philipps' actions worth the resulting frayed nerves, low morale, and strained relations? "Quitting did cross my mind," Philipps confides. "All those complaints! It all got old real fast. And I can't say I don't care whether people like me or not. I do. That year was hell for me! But I stuck with it because I believed in what I was doing, and I wanted to do good for the company. Besides, I'm not the sort who walks away from a job before it's done."

Eventually, the job *did* get done. Tempers subsided; the Primes worked, saving the company over \$1 million a year (just as Philipps said they would); and those who could not accept the new order were weeded out.

The moral of the story? "To do something as unpopular as this, your support has to come from somewhere," Philipps answers. "My support came from the top. Without that, I wouldn't have gotten anywhere."

Unpopular decisions often go against conventional wisdom, challenging what appears to be most practical. If you make an unpopular decision, you are not necessarily doomed to failure, as Philipps' situation demonstrates; but if you are totally oblivious to the political realities, you will not succeed. Sometimes, it's not so much the idea you are presenting, as how you present it and how you have conducted yourself in the past. You can be right, but you can also be *dead* right. Herein lies a tale.

Last year, after serving a five-year

term marked by bitter strife, the head of data processing at a northwestern United States county government resigned. By the end of his tenure, Carl Fletcher (a pseudonym) was being charged with out-and-out incompetence.

"It all started when our department had to move from one area to another because our lease ran out," Fletcher says. "The site chosen by the county board members wasn't suitable for a number of reasons. But they chose it because they knew the owners of the building. I objected, in writing. So they had to discredit me. And it wasn't long before all these innuendos about my performance started cropping up.

"If it wasn't the move, it would have been something else," Fletcher continues. "See, I was a strong manager. And they just wanted someone who would go along with the program."

The man who now holds the job—call him Jerry Kavanaugh—knows the workings of county government well. He worked for the county executive's office for several years before becoming the head of data processing. Kavanaugh agrees that politics played a role in Fletcher's demise. However, he sees Fletcher as his own worst enemy.

"In this job," Kavanaugh explains,



Kathleen Cook, vice president of MIS at Woolworth's Inc., doesn't play the tough guy with employees. She says her sympathetic attitude has worked to her advantage.

"you have to know when and when not to compromise. Carl *didn't* know that. He had a reputation for being uncooperative, argumentative, and narrow-minded. Also, he found it difficult to exercise authority without becoming hostile or getting into an argument."

Fletcher was, says Kavanaugh, an old-fashioned kind of guy, and not at all sympathetic to new ideas—like spreading computing resources out into the user departments. Quite the contrary. Early on, Fletcher pushed for a resolution to take all programmers and system analysts out of the individual departments and put them on his staff. This time, he got his way. But he generated so much resentment among users that his victory's value became dubious. "He may have won the battle," Kavanaugh observes, "but he certainly lost the war."

Was Fletcher the ogre he would seem to be? "People say I was a tyrant," Fletcher reflects. "Maybe that means I tried to get too much done. Or maybe it means I was a worker and they were not. . . . Look, you *have* to be authoritarian to get things done. Every leader is authoritarian. And with a bureaucracy as tough to move as the one I had to deal with, you *had* to push hard or you'd slip backwards."

So Fletcher pushed; he pushed carrying the belief that there was no way to win friends and be effective too. But, pushing as hard as he did, the way he did, he ultimately became *ineffective*. And he paid for it. His life at work was made so difficult that he could no longer do his job. The final straw came when Fletcher was excluded from meetings that determined how his department would operate. So he resigned.

It would be difficult to judge whether, of themselves, Fletcher's policies deserved to be so unpopular. Perhaps it's not even relevant. What is relevant is that, over the course of his tenure, Fletcher made too many enemies. As a result, when he finally started a project whose merit everyone now acknowledges, he wasn't credited for its success.



The accomplishment Fletcher cites was laying the groundwork for the introduction of microcomputers into the county's user departments. He says he conducted at least 14 studies on how to best utilize these machines. Moreover, he says he advocated a liberal policy that would allow users to purchase one of several makes. He also says he advocated the establishment of an information-resource center to coordinate personal-computer activity.

But back at the county, they're not giving Fletcher any credit. "We're establishing personal-computer networks!" Kavanaugh boasts. "I don't think Carl would ever have allowed that."

By being a so-called scoundrel, Fletcher could not survive in county government. But that doesn't mean alleged scoundrels can't survive. Survival is always possible if you have the support of upper management.

Consider the case of Dan Hayworth (a pseudonym), who oversees 82 computer-operations staffers for a federal agency. He's been at the agency nine years, and is in no apparent danger of being removed. Yet, by his own admission, Hayworth is not a popular guy among his subordinates. He's been called "hard-nosed," a "hatchet man," and a boss with a "plantation mentality."

By all accounts, the shop Hayworth inherited when he first came on board in the mid-'70s was a mess. Morale was terrible, productivity was very low, and employees were constantly abusing their privileges. (They would get to work late, leave early, and take much-longer-than-allowed lunchbreaks.) Like John Wayne, Hayworth "rode into town" and cleaned up the place. He eliminated certain breaks, restricted lunch

(Continued from page 135)

time to 30 minutes, wrote people up for the slightest infractions, and, with those who wouldn't conform, instituted firing procedures.

"When I first came here," Hayworth says, "they told me I'd never be able to get control of this place. Well, by implementing these rules, I did get control."

But at what cost? That of staff creativity, initiative, enthusiasm? Hayworth weeded out the bad, says one of his underlings, but he weeded out the good, too. "You don't want to do anything on your own," she says, "because if you take the initiative, and something goes wrong, you really get called on it."

Talking to those who work with Hayworth, a person gets two distinct impressions.

First, Hayworth is definitely not a slap-you-on-the-back, good-time-Charlie kind of guy. In fact, he seems aloof, distant. As one computer specialist says, "He's like a general who sends his soldiers out to die. He doesn't want to get to know any of them personally."

Second, Hayworth is a by-the-book boss who rules in a very rigid way. In other words, when enforcing rules he does not distinguish between good and bad employees. The philosophy is: If you're five minutes late, you're five minutes late—no ifs, ands, or buts. Hayworth's consistency has earned him a reputation for fairness. However, some think he may confuse needed discipline with unnecessary harassment.

"We've talked about this," acknowledges Hayworth's superior. "I've told Dan to loosen up, and I think he has gotten a little less rigid and more open to other people's opinions. But it's a gradual process, and Dan may not have reached the point yet where subordinates would notice a change."

Whether or not he *is* changing, Hayworth's boss generally is happy with the operations manager. "Overall, Dan is effective," he says. And though he allows that Hayworth's style may be creating certain problems while solving others, he gives no



indication that Hayworth's position is in jeopardy.

Meanwhile, back on the shop floor, a union representative for the computer operators voices her opinion of Hayworth. "It's not because he's enforcing these rules that he's so unpopular," she says. "The man's just doing his job. But he doesn't seem to give a damn about us! You can't even get a 'good morning' out of him. He acts so superior. So pompous."

Is Hayworth really uncaring about the people who work for him? "It's not that I have ill feelings toward anyone," he responds. "It's just that I'm a rather reserved person. I guess I'm somewhat of a loner."

If Hayworth really is an insensitive, uncaring lout, it's a shame. But it's a real tragedy if he's not and is unable to communicate this. Then, much of the ill will that has existed



Linda Philipps, MIS director for the Admiral division of Magic Chef Inc., made a very unpopular decision to replace IBM mainframes with Prime minis. The gamble paid off, and she now enjoys greater responsibility and prestige as a result.

and continues to exist in his department is unnecessary.

It's difficult for most of us to understand how managers who play the role of villain can face bad vibes and ill will daily. There is certainly nothing about the art of good management that indicates you must be a villain. Granted, unpopular decisions sometimes need to be made. However, most experts agree that the trick is not to crush, but to neutralize, and then to win over the opposition.

A professor at Harvard University's graduate school of business, By Barnes, is conducting a study to determine the key components of effective decision making. On the basis of the research he's completed so far, he ventures three tentative conclusions:

- Successful managers see their decisions not as finite products, but as ongoing creations. That is to say, they tend not to draw rigid lines between decisions and their implementation.
- Successful managers seek out alliances before pushing ahead with unpopular decisions.
- Successful managers have a strong sense of both time and place. They appreciate the importance of long-term implications over short-term consequences. And they appreciate the value of mingling with the rank and file.

Konosuke Matsushita was one such manager, as Richard Tanner Pascale and Anthony G. Athos demonstrate in their book, *The Art of Japanese Management* (Simon & Schuster, 1981). Matsushita's influence was so strong and positive, note Pascale and Tanner, that when he retired from the huge corporation that bears his name and that is renowned for its benign management style, the company continued to prosper.

Just like characters in literature and the movies, the tough guys among us will achieve short-term goals. But as managers of Matsushita's ilk have shown, tact and diplomacy will best stand the test of time. □



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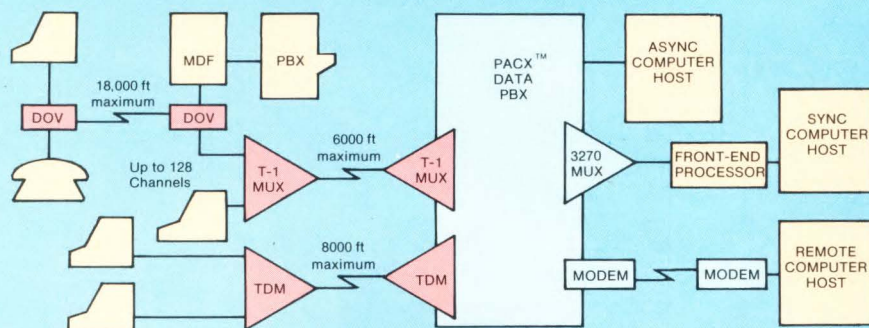
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PROTOTYPING: SHORTCUT TO APPLICATIONS

Prototyping slashes development time and helps produce better applications by making users your partners.

by David Whieldon, Senior Editor

The traditional application-development method hasn't kept up with the times. Corporations need shortcuts to designing and developing applications—and prototyping provides them. The result is better and more economical applications.

Prototyping isn't a new idea, but as more and more organizations bring users into the development of information-processing applications, new attention is being focused on it. "The objective of prototyping is to bring the user into the process so that the application becomes his or her project," says Gus Conoscente, vice president of consumer-information systems at Bank of America, San Francisco. "The user participates in the whole process, so you avoid a lot of the problems associated with traditional systems development."

In the traditional process, a user provides a set of specifications and waits six months or more for analysts and programmers to define the data needed, design a perfect solution, and





generate the necessary coding. Too often, the analyst returns with an application that bears no resemblance to what the user wanted or what he or she can realistically be expected to use, says Conoscente. In many cases, the application is too fouled up to be fixed and the analyst ends up back at the drawing board for a fresh start.

This process' weakness is the initial-design phase, in which the dp pros translate the user's request into a system, according to W.E. Beregi, a development programmer and group manager at IBM's Data Systems Division. In a recent issue of the *IBM Systems Journal*, Beregi wrote that half the defects found after the release of software can be traced to errors in early designs. He also attributed more than half of the cost of developing applications to detecting and correcting design flaws.

Prototyping attacks the design problem by giving system analysts *and users* opportunities to catch design glitches *before* they are set in hard code. The result is applications that more accurately reflect users' requests and require fewer expensive revisions. Says Harvard professor F. Warren McFarlan: "Two movements are under way: One is improved communications between development teams and end users about what the results might be. Together, these groups can sort out the problems before making a big commitment. The second movement is the development of productivity aids that promise significant increases in overall productivity."

A prototype usually begins taking shape as a systems analyst and a user hash out a plan on paper. Next, using a development tool, the analyst maps out the information flow, the method by which transactions will be handled, the kind of information the user wants from the database, and how the data are laid out cosmetically on the screen in a simple model of the final system.

Finally, the user and the analyst work with the screens, moving or changing elements or highlighting them to make the application more

Prototyping

(Continued from page 139)

workable. "If the information is laid out in vertical columns on a screen, the user might ask, 'What if we put it in horizontal rows?'" says R.F. Bel-laver, division manager in application-development technology at AT&T Communications, New York. "In many cases, the prototyper can change the setup right on the screen."

The last phase is the key to the prototyping process, says Gary Guttman, president of Generation Science Inc., a contract-programming house in Syosset, NY. Building a prototype for users to play with *before* the application is put into final production heads off many potential problems, from bugs to inconveniences, and makes for a more flexible solution. "In traditional development setups, dp pros are constantly telling users to freeze the specs," Guttman says. "That's like saying, 'Freeze the world.' Requirements and conditions change, and systems have to be responsive."

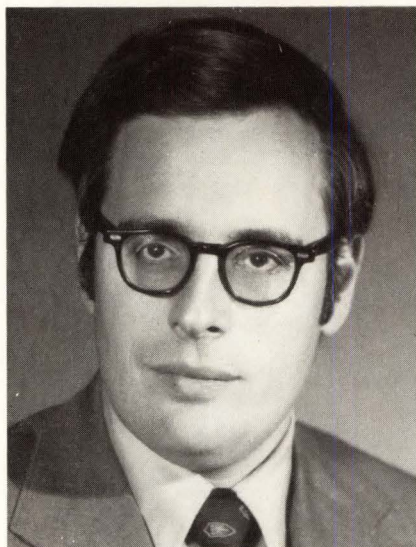
It's during the experimentation stage that analysts and users probably will find critical elements they've overlooked in the application—"holes," in Guttman's lexicon. For example, Guttman's staff discovered a flaw in a security routine that would have prevented authorized users from accessing data and opened the door to unauthorized users. "We closed that loophole before the system went live," he says. "Probably the only way we would have found the problem was by prototyping."

Gaining a competitive edge

Fostering better relations with users won't be directly translated into an improvement of the bottom line. Nevertheless, prototypes may help to improve a corporation's ability to compete by reducing the amount of time needed to generate vital new information systems. As Higbee's, a Cleveland-based retailer, discovered, such benefits help produce concrete improvements of the balance sheet.

Like many other department stores, Higbee's has a bridal registry that helps the friends and relatives of brides-to-be choose appropriate

wedding gifts. The registry was kept in a book, and it was updated—in theory—as purchases were made. However, says Pat McIntyre, vice president of management-information services, the theory was not the reality. "We were always subject to duplication and running two, three, or four days behind," he recalls. In addition, sharing information with Higbee's nine suburban stores was a chore. When top management



Working with a prototype, programmers and users can sort out an application's problems before making a big commitment, says F. Warren McFarlan of Harvard.



"If you could put a price on user satisfaction, the payoff of prototyping would be even higher than it already is." *Gaites, Westinghouse*

heard last summer that an Akron-based affiliate of May Department Stores Co. (St. Louis) and the local outlet for J.C. Penney Co. (New York), its main competitors, were planning to automate their bridal registries, it issued a directive to beat them to it.

"We used Linc, an application-generator from Burroughs, to win the race," says McIntyre. "The software allows you to get to the user a lot faster than conventional methods."

McIntyre's staff started by producing a preliminary design for the automated bridal registry. Next, key employees were asked for their opinions and suggestions. "Our project manager showed the employees real, live screens to get the kind of feedback you don't always get with a blackboard discussion," recalls McIntyre. "We headed off problems we wouldn't have known about until all the work had been done."

The first prototype was completed last August, and four months later, Higbee's introduced its bridal registry—first in its market. The on-line system, based on a Burroughs B 1955, is now installed in 10 of Higbee's 11 stores. Each store's terminal displays each prospective bride's preferences in china, silver, and crystal as well as the items that have already been purchased. A bride-to-be's file is updated each time a purchase is made.

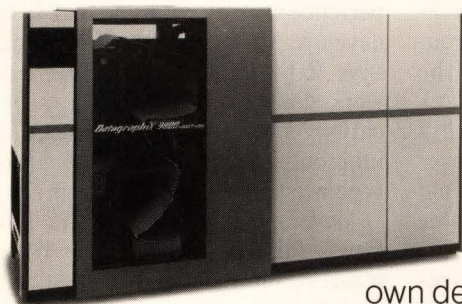
As for the payoff, McIntyre says the jury is still out. "Registrations appear to be higher this year," he says. "But we'll have to run a full year before we can measure the outcome." If the experiences of retailers around the country are an indication, Higbee's should see an increase in wedding-gift sales. Automating a bridal registry typically boosts bridal revenues by 20 percent, he says.

Meanwhile, McIntyre's staff is considering other applications that are appropriate for prototyping with Linc. "We've put in an advertising-scheduling and -control system using Linc," reports McIntyre. The system had been a priority for the advertising staff for some time, he says, but it

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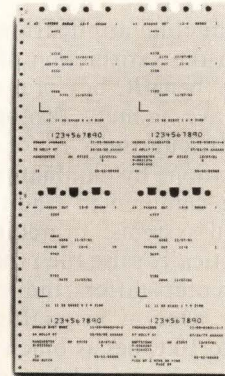
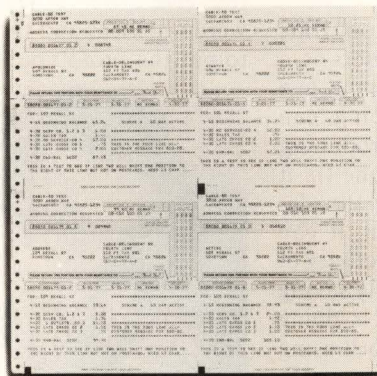
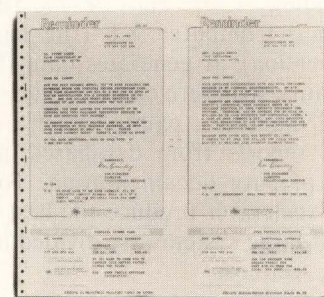
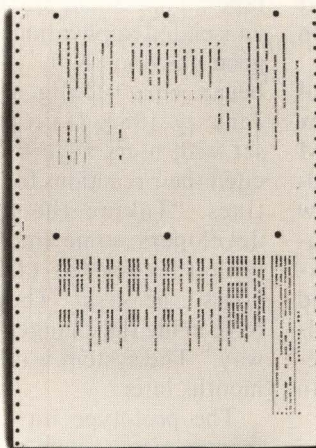
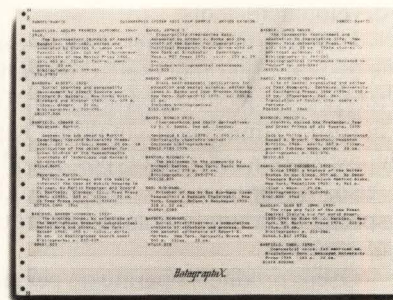
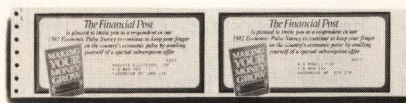
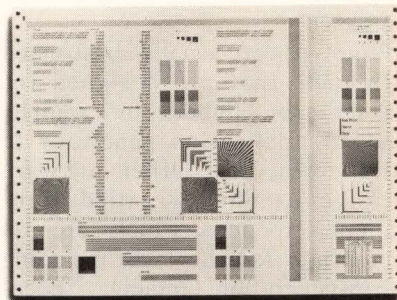
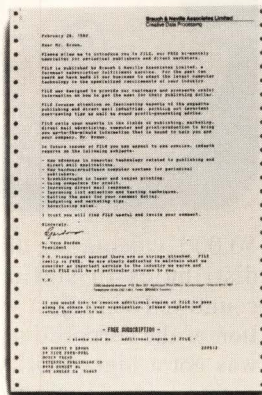
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Prototyping

(Continued from page 140)

wasn't a corporate priority. Without the prototyping tool, the system probably would never have been completed.

Prototypes are usually constructed with tools that are designed for broader tasks. Higbee's, for example, used an application generator to build prototypes. Other software packages commonly called "programmer-productivity tools" are also appropriate for the task, including fourth-generation languages, documentation generators, and system-development tools.

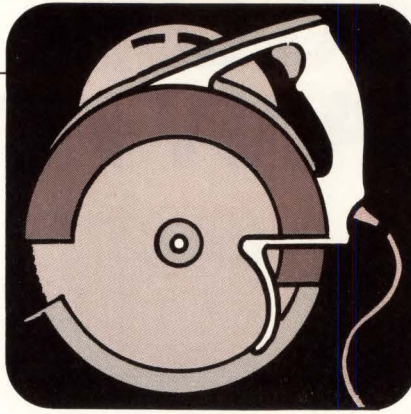
Use.It from Higher Order Software is another tool used to build prototypes. Its Resource Allocation Tool permits simulation, making rapid construction of prototypes possible. Also, it contains a component that speeds data analysis and integration of routines.

Other products operate on personal computers. Excelsior from Index Technology Corp. runs on the IBM Personal Computer XT (the hard-disk version). It generates data-flow diagrams, structure charts, and data-model diagrams; paints screens; extracts reports from databases; and helps prepare documentation. Tools like Excelsior produce the best results if large systems are divided into small sections.

Ten times more work

Producing applications on time and to the satisfaction of users is a worthy benefit, but prototyping can also save money. Prototyping can directly cut the cost of producing applications by eliminating the fix-it coding common to traditionally developed systems. In addition, it can dramatically raise the productivity of data-center staffers, indirectly saving money. One of his staffers is doing eight to 10 times as much work using prototypes as he did developing applications via the traditional method, says Ed Gaites, director of broadcasting information at Westinghouse Broadcast & Cable Inc., Milford, CT.

Westinghouse used a prototype to set up a system to keep track of about



50,000 videotapes of TV shows it distributes to stations across the country. The project was for one section of the corporation, and therefore was not a high priority on the applications-development list. Indeed, Gaites doubts the project would have been completed via the traditional route.

"We had been looking at Burroughs' Linc," recalls Gaites. "The tape-management job, because it was an isolated application, seemed like a good place to try it." A project team began constructing a prototype in January 1983. Gaites and his staff sat with users at terminals and solicited their reactions to suggested routines. "Taking the feedback, the developers sometimes came back with the desired changes within hours," he says. "They could never have made the changes so fast the old way." The system was running three months later.

The prototype for the videotape-management system actually became the "live system," says Gaites. Users were satisfied, and there was no need to put the prototype into production.



Building a prototype for users to play with *before* the application is put into final production heads off many potential problems, says Gary Guttman, president of Generation Science Inc.

A system to administer contracts with radio and television stations was developed by building a prototype and moving it into production. In that case, Gaites' staff built the model system using Data Manager, a microcomputer package from Burroughs, and enlarged its scope in a full-production system interfaced to the corporate-billing application.

Gaites believes the staffer who increased his productivity tenfold is typical. Prototyping has also cut the application-development cycle in half, and that will help his staff reduce Westinghouse's applications backlog. "And if you could put a value on user satisfaction, the payoff would be even higher," he says.

The shortcut as solution

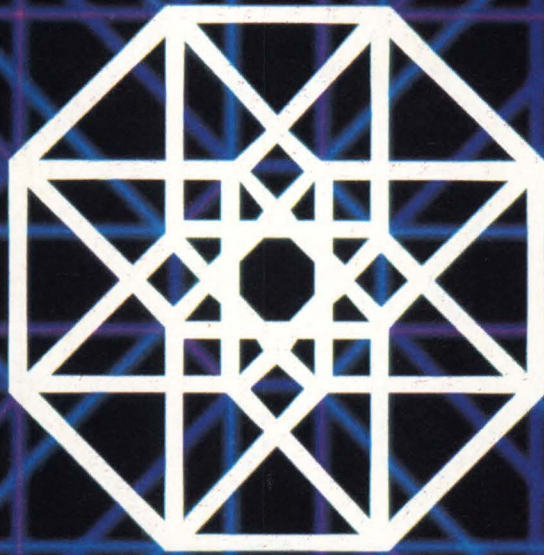
Gaites' experience with the videotape-management prototype becoming a live system apparently was not unusual. AT&T had the same experience with a prototype that system developers were prepared to discard, says R.F. Bellaver. Developers had worked backwards to work up specifications and couldn't even use all the inherent advantages, but the prototype was a hit with the user involved. If developers considered the prototype a failure, the user refused to let it die, claiming it was the "best thing" for his department, recalls Bellaver.

"A user may say, 'Don't bother to do a production version. The prototype does what I want it to do,'" says Joseph E. Urban, associate professor at the University of Southwestern Louisiana. Even if the prototype's benefits are short-lived, users might still be served. Some proponents believe failed prototypes afford users an educational experience. Users involved in their construction learn first hand about the problems that MIS/dp has been trying to explain. For some organizations, the value of this learning experience is worth the cost of wasted time and resources and failed prototypes.

Bellaver believes organizations that use prototyping have a better handle on their work. "There's a bo-

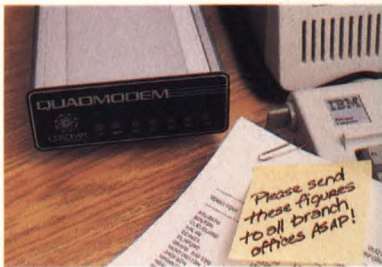
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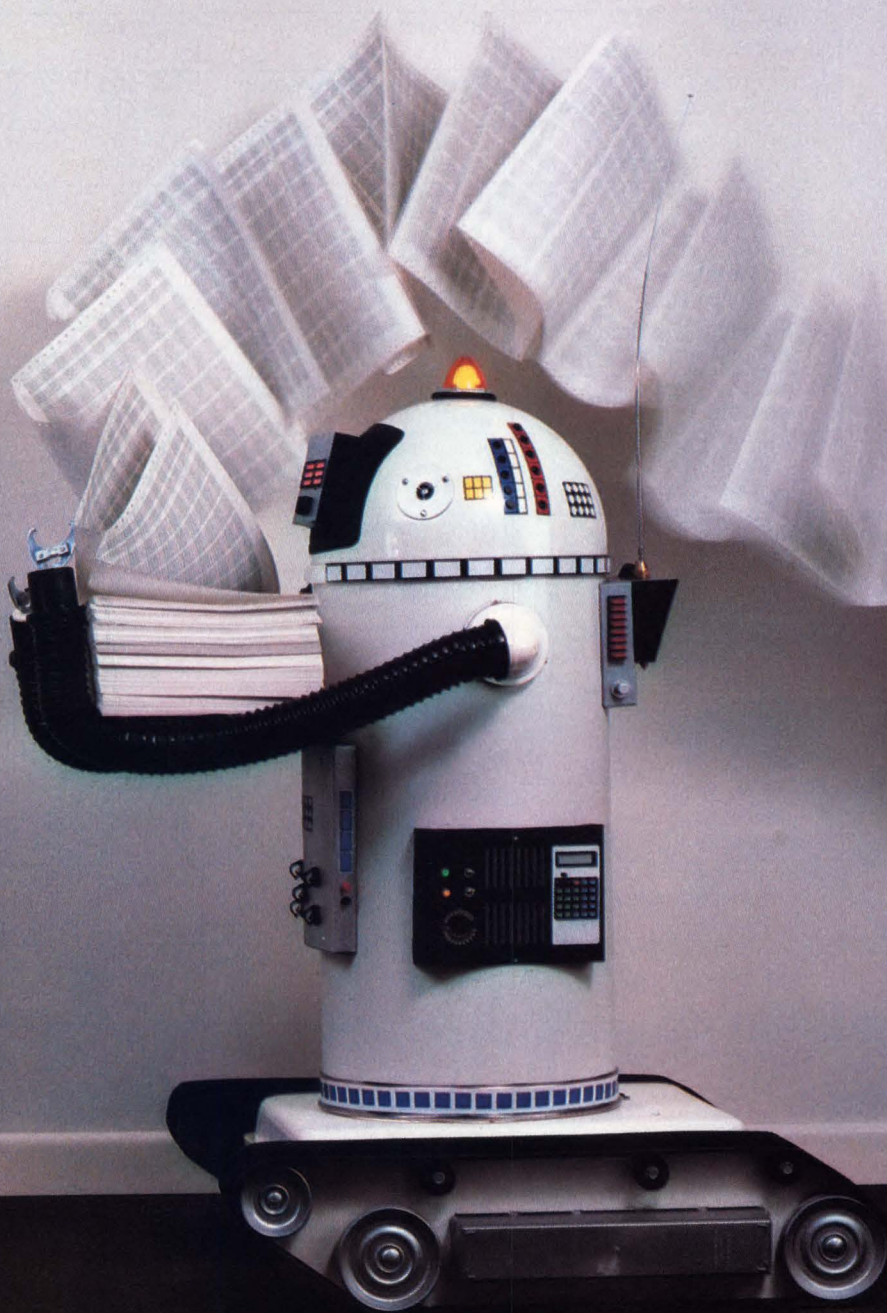


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Prototyping

(Continued from page 142)

nus of ongoing flexibility," he says. His staff builds in what he calls "change hooks," which mark sections of code that might be changed in the future. A year after the prototype is completed, if a user department wants to change elements in the system, Bellaver's staff can locate the pertinent section of code more easily than before. Change hooks improve documentation for updates and

revisions. "If we bring in programmers for rewrites, they can grab onto the hooks," Bellaver says. "That's much faster than telling them to search the listings for the right sections of code."

Prototyping also has encouraged Bellaver to approach large-system development in a decentralized, more manageable way. "For years, the MIS/dp community has decried

systems so large that nobody fully knew them. With prototyping," Bellaver explains, "we can approach development with smaller teams that understand the projects end to end." The teams work up models in a short time, usually about five months. The result of the team approach is high-quality, efficient projects. "It gives staffers a sense of ownership, improves the quality of their work, and

Selected prototyping tools

Vendor	Package	Requirements	Price	Circle
Applied Data Research (201) 874-9000	ADRIdeal (Application generator)	IBM and PCMs	\$200,000	709
Burroughs (313) 972-7000	Linc (Prototyper and system developer)	Burroughs mainframes	\$45,000 and up	711
Bytel (415) 527-1157	Cogen (Cobol program generator)	DEC, NCR, Prime systems	\$3,650 to \$7,500	712
Computing Capabilities (415) 968-7511	Insight (Transaction processor)	HP 3000	\$8,500	713
Cullinet Software (617) 329-7700	Escape (Development and database- migration aid)	IBM and PCMs	\$25,000	714
	ADS/Online (Database- applications developer)	Same systems	\$40,000 and up	
ESI (904) 224-5182	Proxy (Program generator)	Burroughs mainframes	\$19,800 to \$30,000	715
Generation Sciences (516) 496-3060	Gamma (Cobol application generator)	Many mainframes	\$90,000 to \$200,000	716
Bernard Giffler Assoc. (215) 343-3345	DPS (Planning and scheduling system)	Sperry mainframes	\$25,000 to \$40,000	710
Higher Order Software (617) 661-8900	Use.It (System developer)	DEC VAX	\$92,000	717
IBM Contact local sales office	Development Management System/CICS	IBM systems	\$407 to \$685/mo.	718
Index Tech. (617) 491-7380	Excelsior (System-design and documentation tool)	IBM PC XT	\$9,500	720
Information Builders (212) 736-4433	Focus (Fourth- generation language)	IBM and PCMs	\$66,000 to \$130,000	719
Manager Software Products (617) 863-5800	Datamanager (Resource-management system)	IBM and PCMs	\$9,000 and up	721
Mathematica Products Group (609) 799-2600	Ramis II (Storage and retrieval system)	IBM mainframes	\$45,000 to \$90,000	722
Nastec (313) 353-3300	Life Cycle Manager (Project manager)	Nastec Case 2000 workstation	\$3,000 \$18,000 (including workstation)	723
Software Clearing House (513) 451-6742	Cogen Cobol Program Generator	NCR systems	\$3,650 to \$4,400	724

inspires enthusiasm," he says.

Not all prototypes are as successful as the ones described by Gaites and Bellaver; many end up in the trash bin. But according to proponents, experimentation is part of the game and shouldn't be considered a drawback. "Prototyping is called quick and dirty, an expression I don't like," says Gary Guttman. "Quick isn't necessarily dirty or bad."

Sometimes most of the prototypes churned out by a development staff are chalked up to experience. Of the five long-distance-telecommunications applications R.F. Bellaver has put through the prototyping route, his staff has discarded three. Does this low batting average distress Bellaver? Not really, he says. His staff's commitments to the discarded prototypes were not heavy. Organizations must be willing to sacrifice a certain amount of time and effort to attain the benefits of prototyping, he says, and those benefits outweigh the false starts.

The inefficiency of building models only to discard them is one of the key concerns about prototyping. Another is how much mainframe computing and storage capacity prototypes will demand. Are prototypes resource-hungry? Yes and no. Says Westinghouse's Ed Gaites: "I haven't found prototypes to be resource hogs. And the systems generated don't require more hardware than usual."

Nonetheless, cautions Joseph Urban, execution time may be slower in a prototype than in a production version. In addition, prototypes sometimes consume more memory capacity than live systems, he says. That's because a prototype isn't a refined product.

Bellaver cautions against becoming preoccupied with start-up costs. "Even if prototyping calls for expensive machines and software, it's worthwhile because faster application development is what management is looking for," he says.

As far as human resources go, prototyping doesn't impose special requirements on development employ-



ees. "A normal project team does the job," says Gus Conoscente.

According to Conoscente, Gaites, and Bellaver, managers should avoid several pitfalls when making prototyping part of the development process. Most importantly, don't try to prototype systems that tie together transactions in several departments, they say. Gaites, for instance, chose the videotape-management application to be his staff's first prototype because it involved only one department. Under those circumstances, the development staff had better control over the project and the consequences of mistakes weren't so large.

"Start with something simple and self-contained, something that doesn't have to be integrated into another system," advises Conoscente. "Choose an application of modest size. You and your staff will learn more quickly, and be able to keep



"To get started, choose an application of modest size that doesn't have to be integrated into another system."

Conoscente, Bank of America

your arms around the project. Also, you'll reduce the risk of disaster."

If you're looking for a likely place to start, Conoscente suggests a marketing-information system—it doesn't necessarily relate to another automated system. Inventories of real-estate holdings or furniture are other possibilities. Such projects have size and simplicity to recommend them, he says, but they also demonstrate immediate results in functions that are unautomated in many organizations.

Conoscente also urges managers to carefully enlist user members of project teams. The higher the rank of the user members, the better the system will be, he asserts. For example, if you're working on a furniture-inventory prototype, enlist the manager responsible for furniture, not a subordinate. Assign your best analyst to the project as well. Low-echelon staffers don't have a management perspective.

Of course, not all programmers and analysts are suited to be prototypers. They must work closely with users, a role that some technicians find difficult to play. They must have the diplomatic savvy to guide users through the process. In addition, the prototype may imitate a system that's different from the final version, a possibility that users should know about from the start. "Some dp pros are better than others," says Bellaver. "We try to put pros with both programming and interpersonal skills on our teams."

At bottom, prototyping offers managers an instrument to bring the high cost of development—in time, skills, and dollars—under control. But some managers believe prototyping is a vital tool in a distributed-processing setup. Prototyping puts more power and control in the hands of users, helping along the trend toward decentralization. "MIS/dp managers shouldn't feel threatened," says Gus Conoscente. "Their roles are changing. They may become professional consultants within their organizations—or even something better." □



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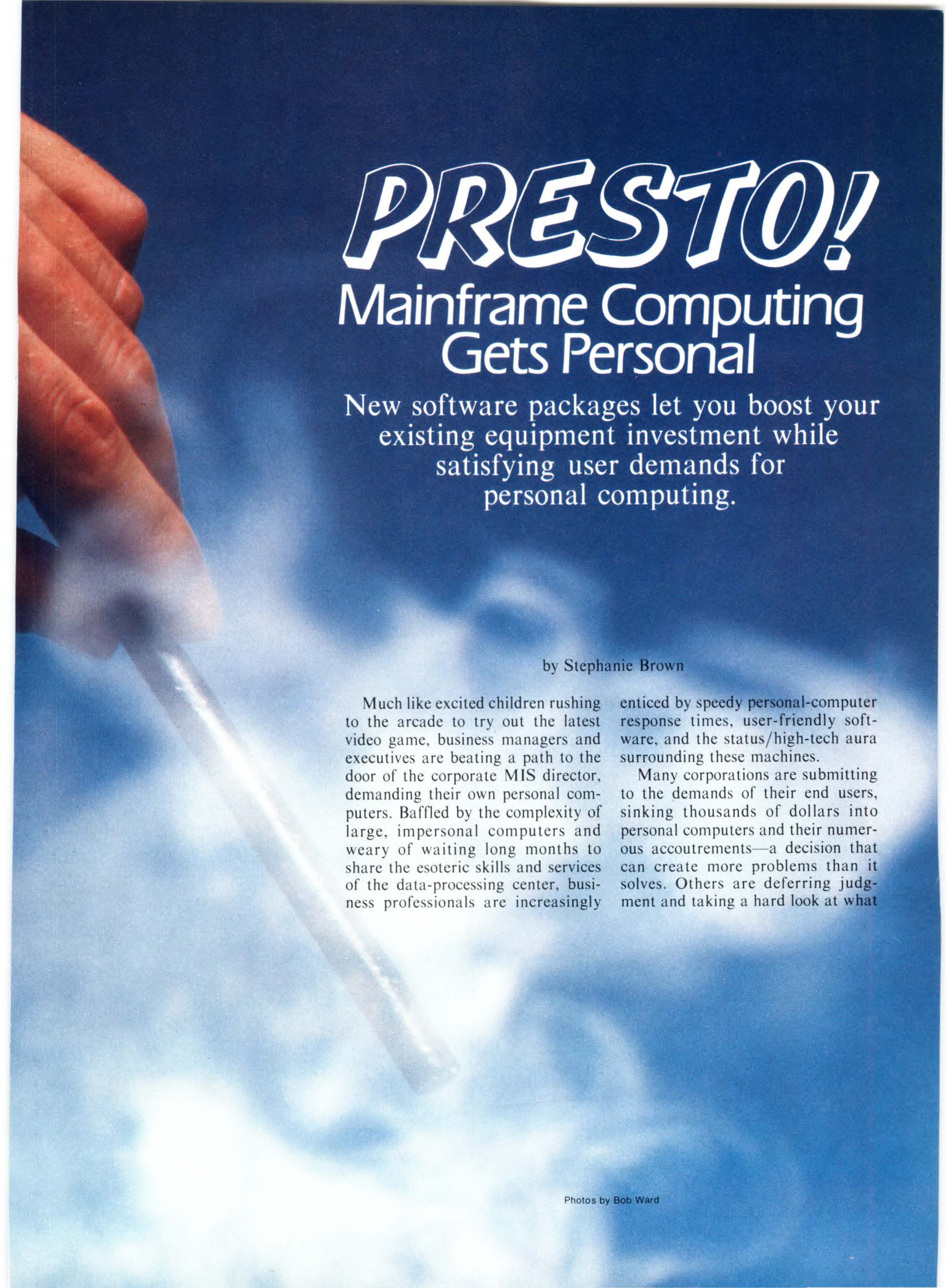
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A hand holding a wand, with a bright light emanating from the tip, set against a blue sky with wispy clouds. The wand is positioned diagonally from the left side of the frame.

PRESTO!

Mainframe Computing Gets Personal

New software packages let you boost your existing equipment investment while satisfying user demands for personal computing.

by Stephanie Brown

Much like excited children rushing to the arcade to try out the latest video game, business managers and executives are beating a path to the door of the corporate MIS director, demanding their own personal computers. Baffled by the complexity of large, impersonal computers and weary of waiting long months to share the esoteric skills and services of the data-processing center, business professionals are increasingly

enticed by speedy personal-computer response times, user-friendly software, and the status/high-tech aura surrounding these machines.

Many corporations are submitting to the demands of their end users, sinking thousands of dollars into personal computers and their numerous accoutrements—a decision that can create more problems than it solves. Others are deferring judgment and taking a hard look at what

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(Continued from page 151)

personal computers really have to offer and what other options are available to satisfy the need for personal computing within the corporate structure.

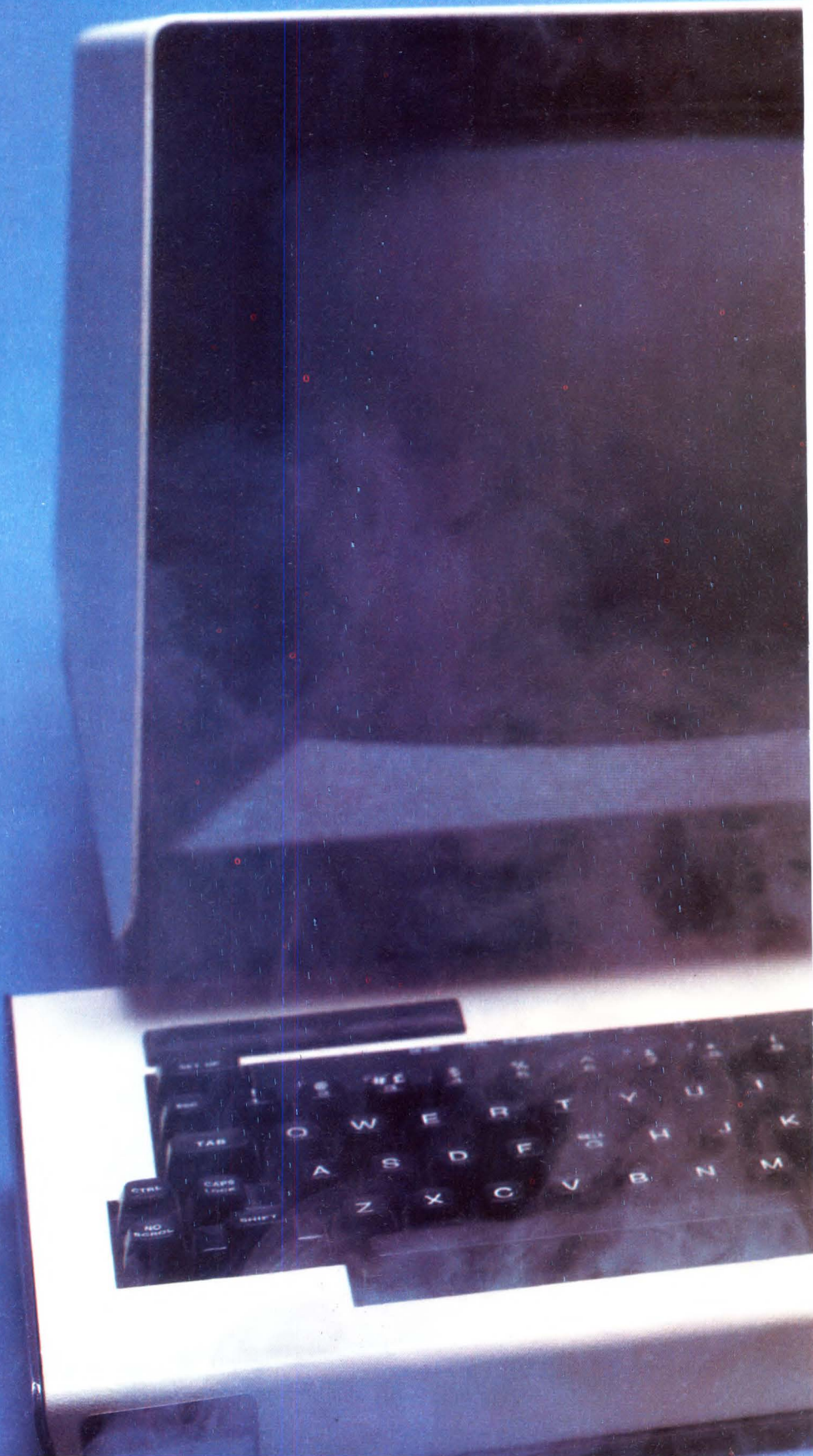
What personal computers do offer cannot be overstated. They provide business users with instant, understandable, easy-access information. However, along with these benefits come certain drawbacks. Once personal computers are installed, users generally want to tap into the corporate database for the valuable information it contains. If this is done haphazardly, database integrity and security are compromised.

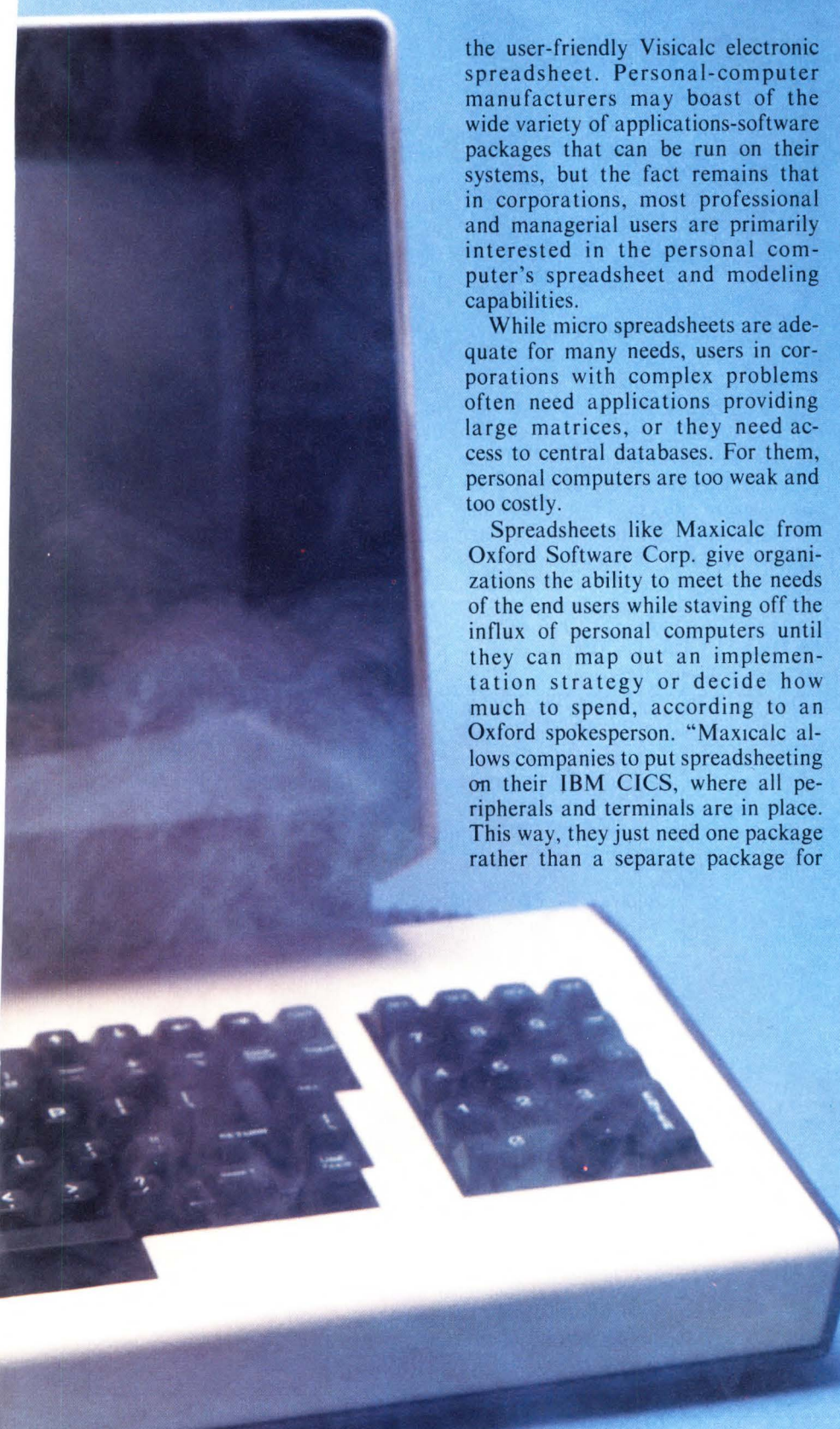
The need to share data and peripheral resources among personal computers often leads to the establishment of local-area networks (LANs) which can multiply by several times the original cost of the micros. In addition, many companies have sizable investments in word-processing or terminal-based systems that are already linked in centrally supported networks with superior minicomputer or mainframe peripherals and which provide access to corporate data in a secure environment.

In light of these facts, a corporation may want to examine some of the options that allow personal computing to be performed on already installed computer resources. To do this it's necessary to examine the needs of the end users in each particular company.

Do you want to use computers to do budgeting and forecasting, build models, simulate "what-if" situations, and perform scheduling—without going back to school to get a degree in computer science? Until recently, this advanced training was almost a necessity, given the complexity and sophistication of most modeling and decision-support software available for users of large computer systems.

One of the main reasons for the burgeoning success of personal computers was the development of



A vintage computer monitor and keyboard. The monitor is dark and appears to be displaying a spreadsheet or similar data. The keyboard is a standard QWERTY layout with dark keys. The entire setup is on a light-colored surface.

the user-friendly Visicalc electronic spreadsheet. Personal-computer manufacturers may boast of the wide variety of applications-software packages that can be run on their systems, but the fact remains that in corporations, most professional and managerial users are primarily interested in the personal computer's spreadsheet and modeling capabilities.

While micro spreadsheets are adequate for many needs, users in corporations with complex problems often need applications providing large matrices, or they need access to central databases. For them, personal computers are too weak and too costly.

Spreadsheets like Maxicalc from Oxford Software Corp. give organizations the ability to meet the needs of the end users while staving off the influx of personal computers until they can map out an implementation strategy or decide how much to spend, according to an Oxford spokesperson. "Maxicalc allows companies to put spreadsheeting on their IBM CICS, where all peripherals and terminals are in place. This way, they just need one package rather than a separate package for

each personal computer."

With an installed base of over 250 corporations, Maxicalc is an online, interactive, menu-driven electronic spreadsheet package designed for IBM System/370, 30XX, 43XX, and plug-compatible mainframes operating in CICS/VS under DOS/VSE or OS/MVS. It provides 512-rows-by-64-columns on a single spreadsheet, arithmetic functions, reporting via any CICS printer in a system, password security, and supports all 3270-type terminals.

Improve security

Gary Kistler, a systems programmer with FDL Foods Inc., a Du-buque, IA-based food processor, says that his department avoids personal computers because they reduce security and control over the database. The corporation wanted a Visicalc-like package that all terminal users could access. It decided to use Maxicalc because it has a password security system and is easy to use.

"Maxicalc is used for engineering, budgeting, accounting, and product costing, and we're currently averaging about 800 to 900 transactions a day," says Kistler. "Labor reports that used to take two days now take three or four hours."

Tied to minis or mainframes, the electronic spreadsheet offers many advantages over the micro-linked spreadsheet. There is a great potential for outdated or inconsistent information when many personal-computer users maintaining separate files on diskettes are let loose on the corporate database. Each user interprets information in different ways, thus generating conflicting data. A central database ensures that data validity is maintained at the local-user level. With data stored on secure media, dp managers avoid the nightmare of end users downloading sensitive files to diskettes that can end up in the trash, or possibly, a competitor's database.

James McLean of JMA Inc. (man-

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(Continued from page 153)

ufacturer of the Opticalc spreadsheet), says, "With the floppy disk, you can lose a lot of data because users don't always make backup disks. In the future, when micros, minis, and mainframes are linked into comprehensive information systems, one of the first products to lose popularity will be the floppy disk."

Last year, Burmah-Castrol, a Hackensack, NJ-based subsidiary of Burmah Oil Public Trading Ltd., decided to install a better spreadsheet program. According to Tracy Marlow, commercial manager, Burmah-Castrol's managers were constantly revising data and their in-house programs were so inflexible that "the simplest program changes became a production." Burmah-Castrol chose Opticalc, JMA's popular spreadsheet for the HP 3000.

In addition to standard spreadsheet features, Opticalc permits



reading of ASCII and DIF files and creation of spreadsheets of up to 254-rows-by-63-columns. Formulas can be entered in either algebraic notation or the HP calculator standard, reverse Polish notation (RPN), at each entry. A recent enhancement to the program allows information to be extracted from the host database in batch mode for applications such as

variance reporting. Over 120 functions are available as well as 24 display formats.

Burmah-Castrol had considered personal computers, but Marlow wanted the flexibility of the electronic spreadsheet. "We needed to do file swapping," says Marlow, "but we wanted to do transfers using electronics—not diskettes. And with the mini's centralized files, we don't have to worry about updating yesterday's figures."

Marlow is very satisfied with Opticalc. His company is doing a lot of financial reporting with the spreadsheet as well as figuring financial and insurance schedules, calculating drydock costs, and negotiating various shipping rates. For users, tasks they used to do with hand-held calculators and large accounting forms are faster, simpler, and more manageable.

With up to 18 users at Burmah-

Upgrades to mimic micros

Vendor	Product	Description	Price	Circle
Computer Concepts (913) 541-0900	Micro-Bridge 80	Allows Wang 2200 to run CP/M under VP, MVP, LVP, or SVP	\$1,995	688
Logicraft (603) 888-4444	QCP-11	Allows DEC LSI-11 to run CP/M	\$1,195	689
	QCP-11+	Allows DEC LSI-11 to run CP/M and MS-DOS	\$1,995	
	UCP-11 single user three users	Allows DEC PDP-11 and VAX to run CP/M	\$1,995 \$4,395	
	UCP-11+ single user three users	Allows DEC PDP-11 and VAX to run CP/M and MS-DOS	\$2,995 \$5,395	
Virtual Microsystems (415) 841-9594	The Bridge	CP/M, CP/M-86, MS-DOS and p-System for Data General under RDOS, ICOS, AOS, AOS/VS; and DEC under RT-11, TSX+, RSTS, RSX, Unix and VMS	\$1,000- \$3,500	690
	Z-Board	Z-80 boards for same systems	\$1,250- \$4,000	
	The Bridge	Allows HP 3000 Series III and HP 3000 Models 30, 33, 39, 40, 44, and 64 to run CP/M	\$5,000	
	Z-Board	Z-80 board for same systems	\$5,000	
	MS-Board	8088 boards for DEC Unibus only	\$4,000	
	Spectrum	Allows DEC VT100 to run CP/M and MS-DOS	\$2,450	
	Bridge 80	Runs CP/M software for Data General, DEC, and HP minis	\$1,000- \$7,500	
	Bridge 86	Allows DEC minis to run MS-DOS	\$1,925- \$7,500	

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(Continued from page 154)

Castrol, the program is constantly in use. Once the normal resistance to a new tool was overcome, the users became acclimated to the system within two or three days. And when four employees left the company, there was no need to replace them. Marlow sums up his experience with Opticalc: "The electronic spreadsheet gives businesses a whole new way of doing things. Implementation may take a little longer than expected—until initial resistance to the new approach is overcome—but in the end, it will improve the way you do business."

JMA is one of many software com-

panies that now combine their micro-style electronic spreadsheets with user-friendly decision-support tools to provide multi-faceted approaches to personal computing on large systems. Opticalc and Opticalc Jr. are fully compatible with JMA's Optiqube forecasting and modeling system, Optichart business-graphics package, and the Optischedule Program Evaluation and Review Technique (Pert) package. Access Technology, Cincom Systems, the Mega Group, and Business Model Systems all offer basic spreadsheet packages for larger computers that can be integrated with a variety of other capa-

bilities, such as text processing.

Pan American Properties (PAP), a New York-based real estate firm with a \$600 million portfolio in 25 states, needed a powerful, sophisticated yet user-friendly modeling system that could integrate a large amount of data on holdings into an evaluation format. The firm had been working on a system that provided cursory rather than detailed analysis. Users weren't getting the financial reporting functions they needed, and they were using handheld calculators for some calculations, according to Bernard Ross,

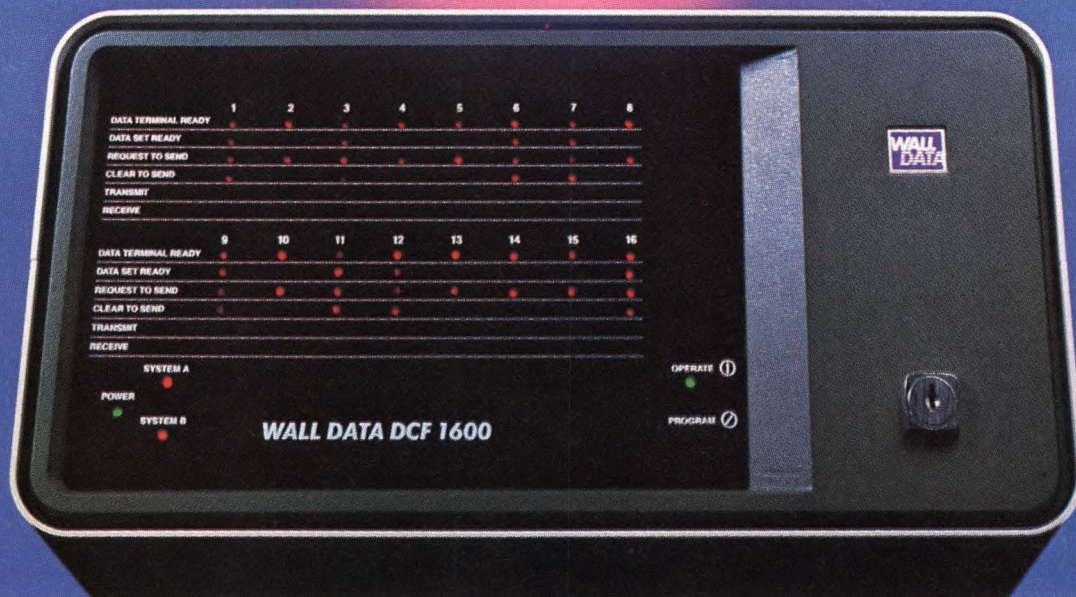
(Continued on page 160)

Micro-style electronic spreadsheets

Vendor	Package	Requirements	Price	Circle
Access Tech. (617) 655-9191	Supercomp-Twenty	DEC VAX, Prime, and other other superminis IBM 370 and 4300 under VM/CMS and 30XX	\$4,800 \$12,500-\$17,000	692
Business Model Syst. (312) 789-9160	Business Modeler + Minitplan	IBM S/34, /36, /38, Wang VS, HP 3000, Prime, and other minis IBM 43XX, 30XX, and other mainframes	\$9,500 \$20,000	693
Chicago-Soft (312) 525-6400	Dynacalc	IBM 4331, 4341, 4361, and 4381 IBM 3083, 3081, 3033	\$8,000 \$9,000	694
Cincom Syst. (513) 662-2300	Mancalc	IBM Environ/1, CICS, or CMS environments	\$19,500	695
Hourglass Syst. (312) 690-1855	Calc Master	Wang 2200 under MVP, LVP, SVP, and VP Wang VS	\$495 \$895	696
Mega Group (714) 474-0800	Megacalc	IBM 4300 under DOS, MVS/TSO, VM/CMS, Tone, and Roscoe IBM 3000 under the Same	\$15,000 \$19,000	697
JMA (713) 871-9134	Opticalc Opticalc Jr.	HP 3000 and DEC VAX Same	\$3,500 \$1,000	698
Oxford Software (201) 288-1515	Maxicalc	IBM 370, 4300, and 3000 under DOS/VSE Same IBM mainframes under OS/MVS	\$9,000 \$12,000	699
Parallax Syst. (212) 475-4001	Execucalc	IBM mainframes under VM/CMS or MVS/TSO	\$5,000	700
Tower Syst. (714) 752-8263	Omnicalc	IBM mainframes under DOS/VSE	\$4,600 and up	701
Trax Softworks (213) 475-8729	ESS	IBM mainframes under VM/CMS, MVS/TSO	\$220/month	702
Westmoreland Syst. (305) 645-0040	Calc/34	IBM System/34 and /36	\$1,550	703

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(Continued from page 156)

data-processing manager.

"We evaluated a lot of modeling packages before finding one that provided the sophistication and conditional-branching capabilities that we needed," says Ross. The package PAP chose was Business Modeler from Business Model Systems (BMS), which now runs on the company's IBM System/34 mini and 5251 terminals.

Business Modeler is a spreadsheet-based financial-modeling package that achieves both sophistication and user-friendliness through a two-tiered approach. For new or casual users, BMS offers Minitplan, which allows users to define single spreadsheet models. For the more experienced user, the full Business Modeler system supports creation of very large and complex models while still using the basic concepts of the spreadsheet. Each model can contain up to 9,999 different tables, and each table can have up to 9,999 lines and 97 columns.

PAP uses the Business Modeler for three primary purposes. A real-estate property-analysis model gives projections for over 10 years based upon current criteria. It estimates the value of a specific property by automatically rolling over leases, calcu-

lating rent increases, and analyzing market trends to forecast whether a tenant will move or renew a lease. The system also produces financial statements for a special director's package, which consists of about 30 schedules.

Yes, but can it cook?

Ross, who has been using the package for over a year, says, "Business Modeler is more like a modeling language. It's logical, easy to follow, and the commands are very powerful. It has a good copy command that lets you copy sections from one model to another without recoding. And it lets you do sophisticated what-if analyses and goal seeking."

But is it easy to use? According to Ross, an accountant, the Business Modeler is relatively easy to operate, but it depends upon the application. He does most of the logic work and builds the brains of the models so non-dp users can get started with just a few hours of training.

Foote & Davies, an Atlanta-based, large-scale printer of magazines and catalogs, required a variety of different spreadsheet capabilities. Says Don Stolzoff, manager of technical support, "Everybody wanted everything, but we didn't have the pro-

gramming staff to do it all." In addition, Stolzoff didn't want to invest in a lot of personal computers and software packages for users when one mainframe package could handle the equivalent amount of work. Early last year Foote & Davies decided on Tower Systems' popular electronic spreadsheet, Omnicalc.

Originally designed for CICS installations over a year and a half ago, Omnicalc was recently enhanced to support VM/CMS and TSO. The product is currently being ported to IBM Series/1, System/34, /36, and /38 minis. Any size spreadsheet up to 255-columns-by-255-rows can be designed, and the spreadsheet's multi-plane, three-dimensional feature allows up to 255 spreadsheets to be consolidated into one summary sheet.

Installed on Foote & Davies' IBM 4341 computer under VSE/CICS, Omnicalc is currently being used by 35 to 40 employees. One major benefit has been the implementation of Omnicalc for the printer's budget system. Information from several departments and divisions, each with its own financial data, payroll, and staff, had to be consolidated at different levels in different areas.

In addition to these advantages, the spreadsheet has proven to be very

Micro-like financial modeling

Vendor	Package	Requirements	Price	Circle
Business Model Syst. (312) 789-9160	Business Modeler	IBM System/34, /36, /38, Wang VS, HP 3000, Prime, and other minis	\$9,500	704
		IBM 43XX and 30XX mainframes	\$20,000	
Comshare (313) 994-4800	System W	IBM mainframes under VM/CMS or MVS/TSO	\$55,000-\$100,000	705
EPS (212) 563-5656	FCS-EPS	IBM mainframes under TSO/CMS	\$55,000-\$100,000	706
Execucom (512) 346-4980	IFPS	DEC VAX 11/730; Data General; Prime 2250; Harris; HP; Wang; and IBM under DOS	\$40,000 and up	707
		IBM and PCMs; Burroughs; Honeywell; Control Data; DEC; and Sperry	\$64,000	
Xerox Computer Svcs. (213) 306-4000	Control	IBM 43XX and 30XX under VM/CMS or MVS/TSO	\$60,000	708
	Control/Strategist	Same	\$25,000	



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Mainframe Personal Computing

(Continued from page 160)

cost-effective. "Omnicalc paid for itself on the very first application we did," says Stolzoff. "A major account came to us on a Friday and wanted to know the discounts on a volume printing job by Monday. There were over 100 iterations involved, and it would have taken several days to come up with the figures by conventional means." Deciding that this would be a good time to try the new package, Stolzoff sat down and spent three or four hours devising a solution to the problem with the aid of Omnicalc. On Monday, the discount figures were ready for the customer. Foote & Davies got the job.

Stolzoff has come across one drawback to Omnicalc. With any program run on a centralized system accessed by many users, response times suffer during peak-usage periods, such as after the first cup of coffee in the morning. (This is one problem personal computers would circumvent.)

"Let the users do it"

On the subject of implementing spreadsheet software, Stolzoff says, "Let the users do it because they know their own needs better than we [the technical or MIS director] do. The MIS director can't hand end users a program and dictate the way it's going to be run—those days are over." If implementation is handled in this manner, end users may go out and get their own personal computers, resulting in a lack of data control.

The Omnicalc spreadsheet has several levels of security to prevent unauthorized access, but at the actual transaction level, Stolzoff advocates lifting controls so end users can develop their own applications. This way, basic control is still exercised while users retain freedom to do what

they want and need. According to Stolzoff, sophisticated applications can be written by end users who are well-versed in their fields, even if they aren't programmers. This freedom and creativity will result in greater productivity in the long run, he adds.

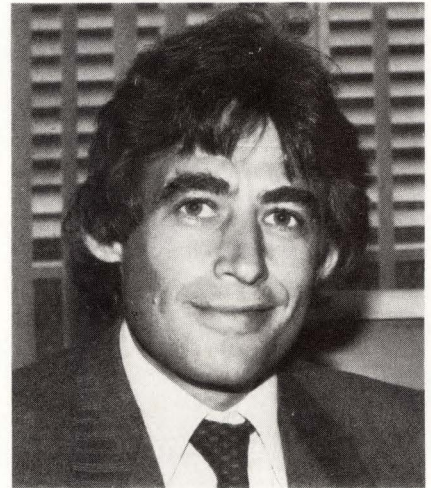
If CP/M- or MS-DOS-based programs are what your end users are clamoring for, you might want to consider (as Foote & Davies did) one of the hardware/software combinations that allow personal computing to be performed on the dumb terminals or dedicated word processors already sitting in your office.

Bridge over troubled waters

In addition to these packages, independent manufacturers offer alternatives to personal computers that are compatible with a variety of larger systems. Virtual Microsystems (VM) markets a range of personal-computing tools for DEC, HP 3000, and Data General minicomputer users under the catchall title of The Bridge. First introduced in April 1982 for DEC minis, it is being used by about 400 organizations. The Bridge makes any terminal connected to the mini appear as a "virtual" personal computer, allowing it to run CP/M, CP/M-86, MS-DOS, or UCSD p-System micro software, depending upon which version of The Bridge is used.

In its most basic form, The Bridge comprises CP/M-simulation software, a license for the CP/M operating system, and a set of utilities that allows you to translate files bidirectionally between the micro format and the minicomputer. Data and programs reside on "virtual" floppies, eliminating problems usually associated with this storage medium. Actually, files reside on the host-disk pack but are structured like CP/M files on diskettes.

Since The Bridge program simulates the operation of an Intel 8080 microprocessor executing CP/M and actually uses the processing power of the host, programs run a bit more slowly than they would on a dedi-



Bernard Ross of Pan American Properties of New York uses the Business Modeler to create real-estate-property-analysis models and financial statements.

cated micro. The rate of speed depends on the host-computer load and the instructions being run.

For this reason, VM offers a variety of hardware co-processors that are installed on the minicomputer bus and accelerate program execution while offloading the host. "The real advantage of The Bridge," says Lance Batten, vice president of VM, "is that it integrates micros and minicomputers in a tightly coupled network. It's centrally archived, available to anyone with a terminal, and operated under the umbrella of a mature operating system to back up data and provide control."

One of the co-processor options is the Z-Board. With four on-board Z-80 microprocessors and 256 Kbytes of random-access memory (RAM), the Z-Board, rather than the minicomputer does the processing. Up to four users per board can run CP/M and p-System-programs with faster-than-average-micro response time since the processing is done by a dedicated microprocessor (the Z-80). Any additional users can rely on the processing power of the host.

"Combined with board devices, The Bridge outperforms the typical personal computer because you have access to the high-speed bus and

(Continued on page 164)



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Mainframe Personal Computing

(Continued from page 162)

peripherals of the minicomputer as well as co-processors that take the processing load off the host," says Batten. "It's like a software switch that opens the door to whole new worlds in computing."

A typical system running on a

DEC VAX 11/730, /750, or /780 with one Z-Board and The Bridge software costs \$7,500. VM also sells CP/M software, such as the Supercalc electronic spreadsheet, Plan80 financial-modeling package, dBase II database management system, and

Select: The Word Processor, as well as MS-DOS and CP/M-86 programs like Multiplan, Supercalc 2, Wordstar, and Pert Master, for prices ranging from \$275 to \$700.

Subtract 10 Apples

Verbex, a division of Exxon Enterprises, which manufactures speech-recognition equipment, was experiencing numerous problems with its personal computers. Consequently, a corporate policy was established with regard to their use on the job. The firm now restricts the installation of personal computers because of the difficulty of maintaining data security and the cost inefficiency of buying separate micros for many employees.

Since Verbex employees needed access to CP/M and MS-DOS programs, the company searched for an alternative and decided on The Bridge. "Before we implemented The Bridge, it was chaos," says Peter Markey, data-center manager. "We had 11 Apples and nobody knew what anybody else was doing, diskettes were routinely damaged, and we just didn't have the power of a 4-Mbyte virtual floppy."

Verbex uses The Bridge primarily to run manufacturing-resource planning (MRP) programs for bill-of-materials, inventory-control, cost-accounting, and order-entry applications. The company originally purchased a Bridge system with two Z-Boards about a year ago for its DEC VAX 11/750 and /780 minis and has just installed a Bridge/86 system.

Markey says he's very happy with The Bridge. "It allowed us to replace 10 Apples with one hardware/software configuration, it gives us more physical security since backup is controlled and standardized, and it's easy to use and install," he says.

A cost-cutting alternative

Michael Goldberg, director of academic computing at Hofstra University in Hempstead, NY, installed The Bridge without giving up on his personal computers. There were about 80 personal computers on campus and about 200 terminals. Goldberg



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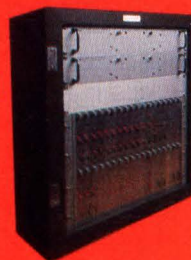
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(Continued from page 164)

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**General
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realized that the terminals could enhance personal computing when combined with a product like The Bridge. "Everyone was waiting a long time to use the personal computers, so we installed The Bridge as a cost-effective personal-computing tool," says Goldberg.

Now, with three Z-Boards installed on the university's DEC VAX 11/782, dBase II and Supercalc (CP/M versions) can be accessed at any time from any of the terminals. Up to 12 users have access to each virtual micro. Goldberg estimates that each of the university's 12 virtual micros cost a little over \$1,000, much less than the cost of a personal computer.

Hofstra experienced minor start-up problems because of the wide variety of terminals used. As with Foote & Davies, response time has slowed during heavy-user periods. Another drawback is that users can't copy their data onto a floppy disk.

Another alternatives manufacturer, Computer Concepts, offers Micro-Bridge 80, a plug-in circuit board that permits a single user to download CP/M from a Wang 2200 mini operating under VP, MVP, LVP, or SVP, and run it on any connected terminal with full access to the 2200's peripherals. The addition of Micro-Bridge 80 boards increases the number of terminals that can access CP/M at any one time.

Introduced in the fall of last year, Micro-Bridge 80 is used in approximately 30 locations. The board contains a Z-80 microprocessor, 64 Kbytes of dynamic RAM, and two serial ports that provide access to a number of online databases, serial printers, and asynchronous terminals. An 86-Board is scheduled for release soon. The \$1,995 price includes the Micro-Bridge 80 board, the CP/M operating system, plus Microsoft's Multiplan electronic spreadsheet. Since some software diskettes that have been reformatted by a disk-translator program are difficult to copy, Computer Concepts also provides disk-copying services for users of Micro-Bridge.



Tracy Marlow, commercial manager of Burmah-Castrol, felt that Opticalc would save his company both the time and the cost of training employees to use personal computers.

Robert Drew, president of Southern Data Corp., has been working with Multiplan on Micro-Bridge 80 since January and is pleased with the way it performs. Southern Data, based in Raleigh, NC, is a systems house that specializes in plug-compatible memory products and turnkey software applications for Wang 2200 and VS minis. Drew installed Micro-Bridge 80 to evaluate the system before offering it to his customers. "The product opens up many new applications for the 40,000 to 50,000 Wang machines out there," says Drew.

Drew conducted his own benchmark tests on Micro-Bridge by running Multiplan and found that it's about twice as fast on a typical operation as either the IBM PC or the Wang Professional Computer. He attributes this characteristic to the Wang minicomputer's more powerful resources. Drew did find, however, that a lot of CP/M programs are amateurish. You may have to sift through quite a few applications before coming up with the best one for your organization, he warns.

Some options, like The Bridge, Micro-Bridge 80, and Logcraft's "Cardware," attack the problem of distributing personal-computer capabilities with devices that are installed on the host. These rely on the computer's peripherals and processing power combined with the local power of the on-board microprocessors. (Continued on page 168)

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(Continued from page 167)

This approach, as we have seen, has distinct advantages. But what if you need sophisticated graphics or instant access to printers? Perhaps you want an immediate copy on diskette of the file you just created? Or maybe you want to take your personal-

computing enhancement with you? These are needs that are not directly addressed by mini-based solutions.

Other enhancements, however, deal with the problem from the terminal end of the system. Spectrum, another aspect of VM's Bridge sys-

tem, is one example. Spectrum is a multiprocessor board that transforms a DEC VT100 terminal into a micro-computer with the advantage of bit-mapped graphics. According to VM's Batten, Spectrum was developed solely to provide advanced graphics. The board includes an Intel 80186 microprocessor that provides I/O control and file transfer between the host and the terminal, an Intel 8086 for MS-DOS, and a Z-80A for CP/M capability.

The Spectrum system is designed as a virtual implementation of the DEC Rainbow, yet switches easily between terminal, CP/M, or MS-DOS arrangements. As with The Bridge, users work on virtual diskettes stored on the mini, but an interface for a floppy-disk controller that can handle up to four 5¼-inch-diskette drives is also provided.

The emergence of micro-style software for large systems and hardware/software upgrades that allow terminals to run micro software indicates that the personal computer is not the only vehicle for personal computing within the corporation. The fact that many personal computers are being offered in multi-user setups, like local-area networks (to share data, disks, printers, and other peripherals) merely emphasizes the importance of their communications functions.

Recently announced intelligent terminals and universal workstations provide built-in local-processing power and terminal functions in one unit, combining the best of both worlds. Such products, like Lee Data's Universal Terminal System and Phaze Information Machines' Gemini 3278 Business Computer, can bring the full advantages of personal computing to end users in the most secure and efficient way.

Before you decide which route to take, consider the many inexpensive personal-computing options that exist today. These options allow businesses to use available resources, until they can determine what will take shape in the volatile realm of personal computing. □



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CARE AND FEEDING OF DISKETTES

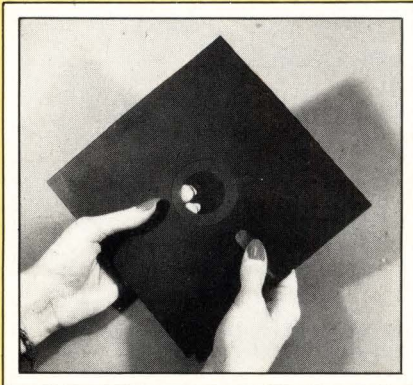
Careful handling and a regime of preventive maintenance will head off diskette-related losses of data.

by Alan Whitebread and Jim Coady

Diskettes have become almost as common as paper in the nation's offices. But diskettes must be handled much more carefully than paper. Without proper care, these computer commodities can cause high-tech havoc.

Diskettes are egalitarian: They'll scramble data when mistreated by anyone, whether the perpetrator works in the data center, the word-processing department, or the executive suite. Because diskette mistreatment is usually fatal to data, users in your organization will benefit if you outline procedures and policies for regular preventive maintenance and conscientious care.

Unfortunately, many users don't recognize the fragile nature of magnetic media. The technical-services



Rule 1: Don't touch media.

department of Wabash Datatec has received many calls for help during the past year, and most of the diskette disasters users described could have been prevented. We're convinced that user updates on the care and feeding of diskettes can never be too frequent.

Consider, for example, the following caller's question: "I store disk-



Rule 2: Don't bend diskettes.

ettes in the back of my plant with the rest of the supplies. Of course, I don't air-condition the warehouse, and we've had a heat spell here in Florida. Am I doing something wrong?"

Our answer was, "Yes." Always store diskettes in a dry, temperature-controlled place. They won't hold up if they're subjected to the same conditions as other office supplies, such as paper clips and pencils.

Another caller described a different way of inflicting heat damage. "I left my diskettes on my car stereo and forgot them for a few hours. The day was hot, my music was cool, but now my diskettes are fried to a crisp. Management is screaming for the information on the disks. Can my data be saved?"

Once data has, in the phrase of this caller, been fried, they are unretrievable. As the old saying goes, "You can't put the egg back in the chicken after it's been scrambled." Direct sunlight is deadly to diskettes.

Another caller's foul-up was a little less serious—maybe. "While attempting to put my diskettes in the trunk of my car, I dropped them in a puddle. Now they're hanging out to dry. Do I dare submit them for processing?"

In this case, our answer was "Maybe." If diskettes get wet, clean the disk-drive heads first, and then submit diskettes for just one pass. If they haven't been damaged by the water, the data should pop right up on the screen. If not, remove diskette immediately, clean the head again, and give it one more try. You may get lucky.

Eight dos and don'ts

If you calculate the value of a diskette in terms of the information on it and the hours of labor spent inputting that information, a \$5 diskette becomes worth thousands of dollars. If your employees understand that, they'll treat diskettes accordingly. Most manufacturers agree the prognosis for mishandled diskettes is poor.



Rule 3: Avoid extreme heat or cold.

Once diskettes have been damaged, there's little chance that the information on them can be retrieved. In view of the value of diskettes, it never hurts to review the fundamental precautions.

1. Don't touch any part of the exposed media. Even the tiniest speck of body oil can attract dust that inter-

(Continued on page 172)

Introducing an IBM-compatible multiplexing scheme that multiplies your terminal network options.

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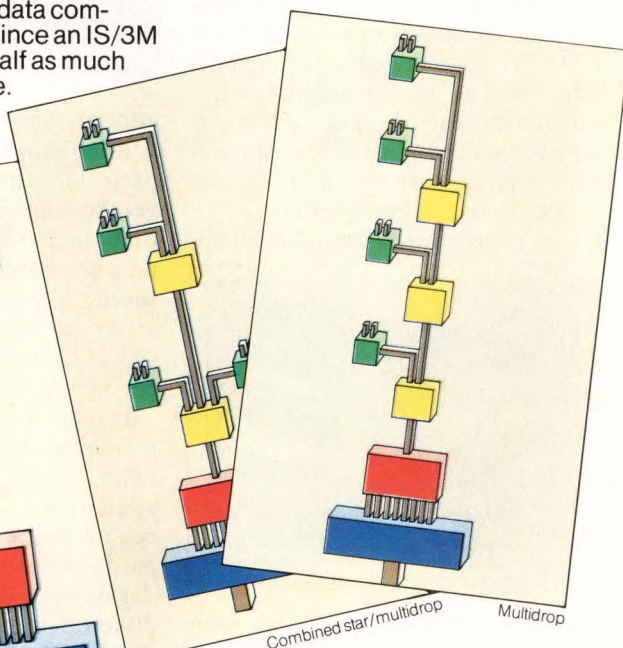
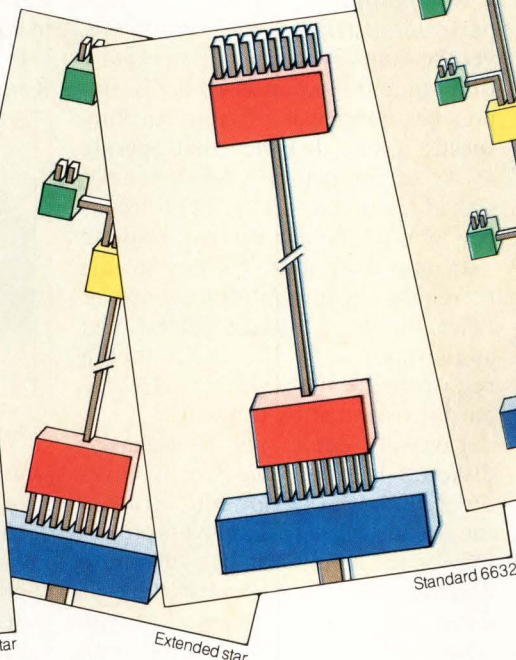
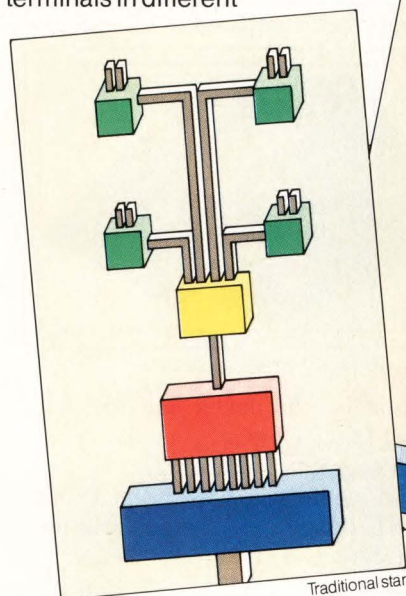
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(Continued from page 170)

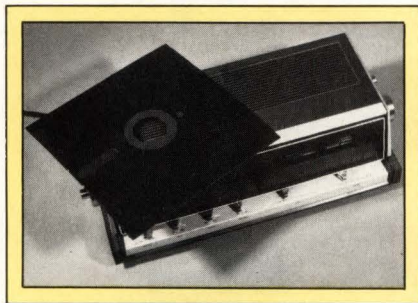
feres with magnetic recording.

2. Don't bend diskettes. Bending can permanently warp or crease the media, changing the speed at which a diskette spins in the drive and interrupting contact with the read/write head.

3. Avoid extreme heat or cold. Don't lay diskettes on terminals, computers, or other electrical equipment. Heat generated by these machines can cause diskettes to warp or crack.

4. Don't expose diskettes to magnetic fields, such as those generated by audio equipment, pocket radios, or loudspeakers. Interference can destroy the pattern of impulses recorded on the diskette surface.

5. Don't expose diskettes to metal ob-



Rule 4: Avoid magnetic exposure.

jects like repair tools. Tools—even scissors—often are magnetized during routine use.

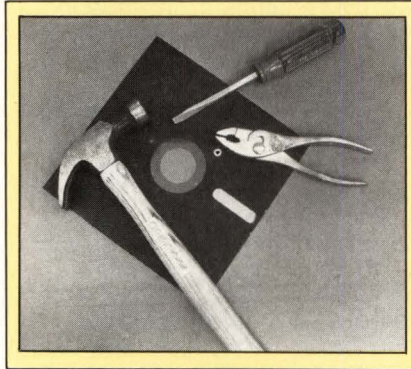
6. Write on diskette jackets or identification labels only with felt-tip pens—and even then with a light touch. A ball-point pen or a pencil can scratch a diskette through its jacket.

7. Don't place heavy objects on a diskette or stack more than a few diskettes. Too much weight can warp the media.

8. Don't smoke, eat, or drink near diskettes. Even the tiniest particles can collect on the exposed media and interfere with magnetic recording.

Educate your users

Disk manufacturers believe most media problems are caused by users. They stress training as the key to preventing snafus that foul tempers and waylay production schedules. The following are important points to consider in the day-to-day use of disk-

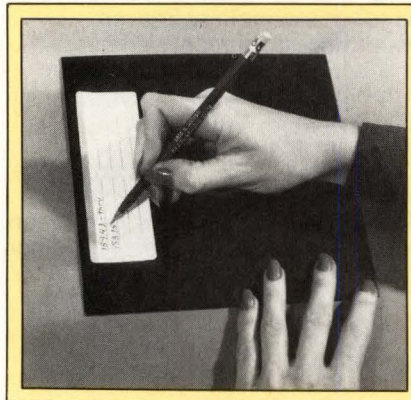


Rule 5: Avoid metal objects.

ettes in your operation.

Compatibility is essential for peak performance from your hardware, yet the industry is evolving so rapidly that standardization is virtually impossible. Beware of different tracking speeds. Using diskettes that operate at 48 tracks per inch in drives designed for disks running at 96 tracks per inch is playing Russian roulette with data accuracy. You may be able to ignore incompatibilities once or twice, but don't make it a habit. Get acquainted with the exact media requirements for your particular hardware and stick to them.

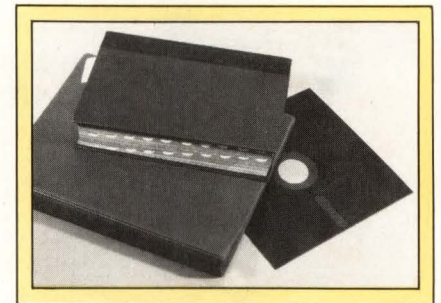
Likewise, don't use single-density diskettes when double-density disks are required. Intermittent errors—the dreaded spotty-data syndrome—may be the result. You can substitute double-density disks in single-density-disk applications, but you could wallpaper your data center with the dollars you'll waste. Be sure to check the specs and use the diskette density compatible with your equipment—it pays off in the long



Rule 6: Use felt-tipped pens only.

run. Density, tracking speed (expressed as TPI), soft sector vs. hard sector, and initialization are clearly marked on diskettes.

Back up your system daily and "dump" your data into a library or an archive at the end of the week. The most popular method for backing up disks deploys three diskettes in rotation. Begin with two master copies of your data. Make alterations and add work you've just done to one of the master copies, and copy it on one of the other disks. Repeat the process each time you work on the material. In this way, all three diskettes remain in constant rotation, so you can never lose more than the work in progress. Remember, compared to the value of



Rule 7: Don't stack disks.

your data, the media is a real bargain. Make copying your data standard operating procedure.

Simple diagnostics are the difference between costly service calls and cost-effective in-house solutions. Contrary to popular opinion, the problem may not always be in your media. Take errors, for example. Unless they're consistent, errors don't necessarily mean diskettes contain defects. Reinitialize the disk in question to determine if the errors repeat themselves in a regular pattern. Perform this sequence several times if necessary, and test the diskette in a different drive. If errors aren't repeated, the likely culprit is your disk drive, or related hardware.

Reinitializing is also a way of checking for error-causing debris on the diskettes. The movement of the diskette may dislodge dust or other foreign material causing problems.

Diskettes are fragile so treat them with care. Users tend to think of disk-

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CIRCLE 74

Diskette Maintenance

(Continued from page 172)

ettes as durable commodities, but rough treatment can be costly. Remember to store diskettes in their envelopes in a dust-free place, preferably a diskette case. Never stack disks, and keep them clean. Cleanliness is vital because there is no foolproof way to clean soiled diskettes.

Here are other miscellaneous tips that will prove useful to your organization:

- On 5¼-inch diskettes, cover the lockout notch to protect recorded data. On 8-inch diskettes, remove the lockout tab.
- Always be sure diskettes are properly inserted in disk drives. Never force a diskette in or out, and make sure single-sided disks are inserted right side up.
- Magnetic disturbances are rarely serious unless direct exposure occurs. However, in airports, request a hand search by security officers before boarding flights in case metal-detection equipment is improperly



Rule 8: No food, drink, or cigarettes.

shielded.

Many users understand the value of preventive maintenance, but they don't know exactly what the term entails. You must remind them to check the wear and alignment of disk-drive heads. We recommend a thorough check-up for equipment every six months to keep drives and recording heads in peak condition. Clean the

heads regularly in accordance with manufacturers' recommendations. Diagnostic diskettes are available for checking both the condition and performance of disk drives. They are a good investment because they can save money on unnecessary drive repairs and diskette replacements.

In the fast-paced world of data processing, the care and feeding of diskettes will probably never become a cause celebre. However, as information processing permeates the mainstream of corporate life, "quality control" in data processing will become more important than ever. Managers who have a handle on the disks their organizations are using will be ready when that day arrives. □

Alan Whitebread is marketing manager for diskettes and Jim Coady is manager of technical services for Wabash Datatech, Inc., Des Plaines, IL.

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CIRCLE 88

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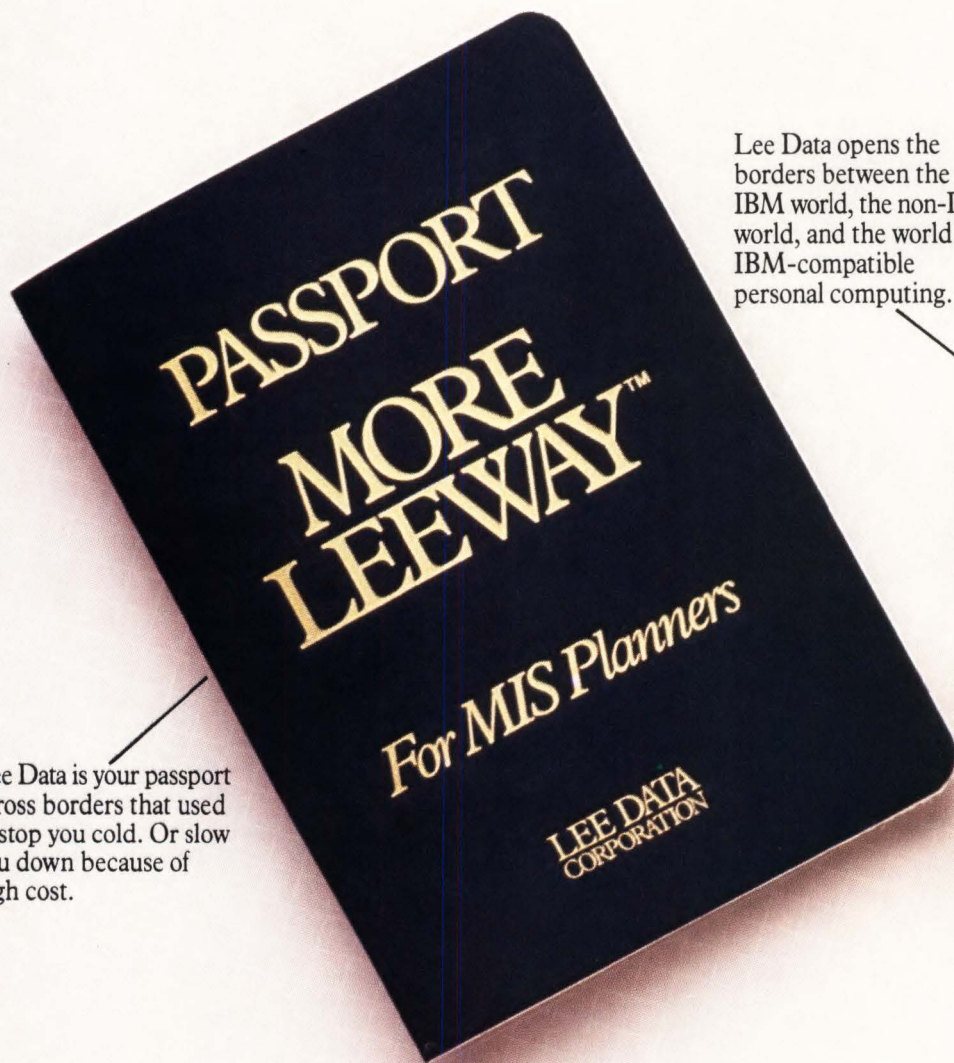
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SPECIAL PULLOUT SECTION

THE TOP 100

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CIRCLE 100

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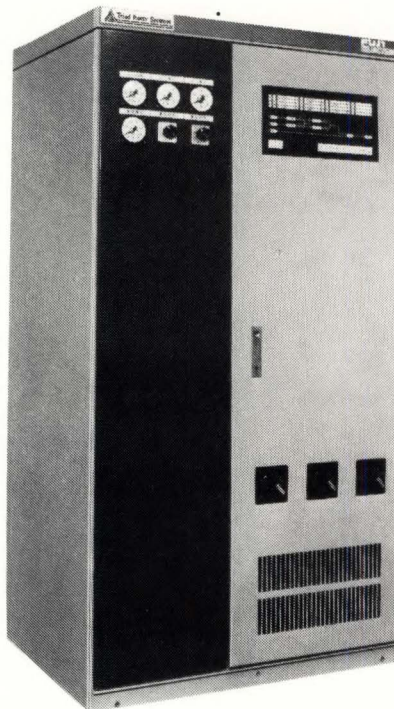
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CIRCLE 103

After a disappointing start, the Top 100 dp vendors roared back to set new records for revenues.

by William Cappelli

As the economy picked up momentum last year, data-processing vendors—leaders among high-technology businesses—went on a roll. Growth, in terms of revenue, was impressive—phenomenal for some corporations. Suppliers of computer hardware, software, and services were ready to cash in on the increased demand for capital goods and processing power spurred by the robust economy.

The major developments of 1983 included the resurgence of the original-equipment manufacturers (OEMs), fueled by a surging demand for data storage, and the start of a shakeout of personal-computer manufacturers. Several crucial strategic errors by microsystem vendors and the powerful lure of IBM standardization contributed to an upheaval in the personal-computer segment. IBM emerged with the lion's share of the market. Indeed, for the first time, IBM's revenues from personal-computer sales surpassed those of Apple Computer.

Led by IBM, the 100 largest vendors in dp recorded aggregate revenues of almost \$91.06 billion (Table 1). The aggregate total represents a nominal increase of 16 percent over the \$78.1 billion aggregate recorded by the 1982 edition of the Top 100 (the two rosters are not identical). The gains made by dp's Century Club are even more impressive in light of the disappointing first-half results many reported. Most suppliers registered gains in 1983 only during the last two quarters.

This year's 100 top dp vendors registered a 16.7 percent nominal increase over their 1982 aggregate results of about \$78 billion. Adjusting these results for inflation (using the

This is the fifth edition of Gartner Group's list and analysis of the Top 100 data-processing vendors—the third one that has appeared exclusively in Computer Decisions. Copyright 1984 by the Gartner Group, Stamford, CT.



Photo by Bill Oliwa

THE TOP 100

federal government's formula), the Top 100 of 1983 grew by 13 percent in real terms. In comparison, the gross national product grew a mere 3.4 percent in real terms during the same period.

The narrowing of real- and nominal-growth rates evident in the 1982 results continued last year. The 1982 edition of the Top 100 registered a 16.8 percent real-growth rate and a 20 percent nominal rate, compared to this year's 13 percent real rate and 16.7 percent nominal rate. These figures suggest that although the dp industry has continued to expand at a healthier rate than other segments of the economy, it is becoming more closely integrated with the rest of the economy and more sensitive to business cycles. However, if the Top 100 is more vulnerable than before to recession, it won't feel the pinch for at least the next year, as the economy continues to boom.

The cutoff point—in revenues—for admission to the Top 100 leapt an incredible 31 percent for the 1983 list. The last vendor on the list in 1982, American Management Systems, recorded revenues of \$70 million. That vendor isn't even on this year's list, and Cipher Data Products, which checked in at No. 100, registered \$92 million in revenues.

As might be expected, several corporations were unable to keep up with this breakneck pace. Nine companies fell from the Top 100 during the course of 1983, up from three during 1982. Sundata, ModComp, McGraw-Hill's DRI subsidiary, Comshare, Systems Industries, Bradford National, Lear-Siegler, Anacom, and Triad failed to generate enough dp business for inclusion on this year's roster. No companies were lost to acquisition—a somewhat surprising development in a merger-mad year—but this situation will change in 1984. Lanier and Harris completed a merger in late October (so they are listed separately in this report), while McDonnell Douglas is acquiring Tymshare.

Newcomers to the ranks of the Top 100 include Compaq, a Houston-based manufacturer of IBM PC-compatible portables. It was cata-

(Continued on page G10)

Table 1

The Top 100

U.S.-based vendors, ranked by 1983 dp revenues (Dollars in millions)

Rank				Dp revenues			Growth '83/'82
'83	'82	'81		'83	'82	'81	
1	1	1	IBM	\$37,367	\$31,467	\$25,111	18.7%
2	2	2	DEC	4,826	4,019	3,586	20.1
3	3	6	Burroughs	4,038	3,809	2,478	6.0
4	4	3	Control Data	3,507	3,301	3,120	6.3
5	5	5	NCR	3,040	2,838	2,714	7.1
6	6	4	Sperry	2,799	2,802	2,775	-1
7	7	7	Hewlett-Packard	2,518	2,268	1,875	11.0
8	9	9	Wang Labs.	1,792	1,321	1,008	35.6
9	8	8	Honeywell	1,666	1,685	1,774	-1.1
10	10	11	Xerox	1,222	1,050	872	16.4
11	19	22	↑ Apple Computer	1,084	663	400	63.4
12	13	12	TRW	1,015	825	855	23.0
13	26	45	↑ Commodore Int'l.	969	420	176	130.8
14	16	19	↑ Tandy (Radio Shack)	945	725	460	30.4
15	14	13	Data General	867	803	764	7.9
16	11	10	Storage Technology	860	1,030	890	-16.5
17	17	17	Automatic Data Processing	816	712	624	14.6
18	12	14	General Electric	800	850	735	-5.9
19	24	21	Amdahl	777	462	442	68.3
20	15	15	Texas Instruments	739	746	640	-1.0
21	18	16	Computer Sciences	718	683	624	5.2
22	20	18	Electronic Data Systems	694	555	480	25.0
23	30	25	Management Assistance	559	354	349	57.9
24	21	20	Datapoint	554	513	452	7.9
25	23	26	McDonnell Douglas	542	474	346	14.4
26	25	24	Prime Computer	516	435	364	18.5
27	22	44	Motorola	514	484	180	6.0
28	27	27	National Semiconductor	486	387	320	25.7
29	33	36	↑ Tandem Computers	450	330	242	36.1
30	28	23	Teletype	437	377	368	15.8
31	36	33	Computervision	400	325	270	23.0
32	40	37	Racal-Milgo	387	300	240	29.0
33	29	28	Mohawk Data Sciences	384	355	314	8.1
34	35	42	↑ C.Itoh	360	326	213	10.4
35	38	31	Dataproducts	352	318	289	10.5
36	54	84	↑ Tandon	343	177	70	94.2
37	32	30	Tektronix	338	336	309	.7
38	37	32	Gould	334	325	280	2.8
39	45	41	3M	330	223	220	48.0
40	34	27	Triumph-Adler	330	327	320	.9
41	31	29	Harris	327	344	313	-5.0
42	32	34	Raytheon	302	336	260	-10.1
43	41	38	Tymshare	288	297	235	-2.8
44	39	67	Warner Communications	281	310	115	-9.4
45	43	43	Boeing	275	264	206	4.2
46	42	35	ITT	265	265	250	0
47	61	74	↑ Intergraph	252	155	91	61.9
48	48	54	Philips Information Systems	250	203	140	23.2
49	51	47	Lanier Business Products	223	194	161	14.8
50	105	n/m	Seagate	222	56	n/m	289.9

↑ = Vendor moved up in ranking two consecutive years.

n/m = not meaningful n/a = not available n/c = not calculable

* Summary figures for 1982 and 1981 exclude revenues listed as n/a or n/m.

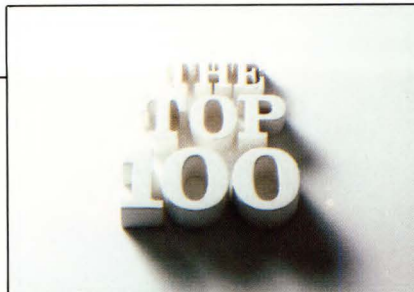
Alphabetical index to corporations in the Top 100 is on page G42.

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TOP 100

Rank				Dp revenues			Growth '83/'82
'83	'82	'81		'83	'82	'81	
51	65	56	United Telecommunications	222	148	137	50.0
52	50	55	Telex	221	194	142	13.8
53	44	40	Northern Telecom	220	237	222	-7.2
54	46	39	Perkin-Elmer	213	207	226	3.2
55	57	59	↑ Shared Medical Systems	210	165	131	27.2
56	47	57	Paradyne	210	207	135	1.3
57	53	46	Sanders	207	181	166	14.3
58	60	n/m	NEC Information Systems	200	160	n/a	25.0
59	52	49	Nixdorf Computers	200	186	159	7.5
60	56	50	Informatics General	197	170	150	16.3
61	58	68	M/A Com	196	164	112	19.2
62	49	48	Allied	195	195	160	0
63	60	61	CPT	192	158	123	21.1
64	63	58	General Instrument	191	152	135	26.1
65	59	52	Signal Companies	180	163	147	10.4
66	71	86	↑ Dysan	178	138	63	28.4
67	70	65	Centronics Data	170	139	116	21.6
68	67	70	Cray Research	169	141	101	20.2
69	85	98	↑ Televideo Systems	168	98	34	71.2
70	55	51	Schlumberger	167	175	148	-4.5
71	86	100	↑ Convergent Technologies	163	96	13	69.5
72	69	63	Grumman	157	140	119	12.1
73	74	75	↑ Quotron	153	120	88	27.2
74	68	53	Wyly	152	140	146	8.9
75	78	71	Dun & Bradstreet	150	110	100	36.4
76	73	72	Martin Marietta	149	122	98	22.5
77	80	78	First Data Resources	148	106	81	40.2
78	88	85	Verbatim	147	91	68	60.3
79	75	66	Reynolds & Reynolds	147	119	115	22.9
80	83	82	Management Science America	145	101	73	43.4
81	66	64	Planning Research	143	146	117	-2.3
82	76	97	NBI	140	119	43	17.5
83	79	69	Gerber Scientific	135	107	101	26.4
84	106	n/m	Continental Telecomm	130	52	n/m	150.0
85	82	83	National Data	128	103	71	24.3
86	84	n/m	Zenith	125	100	n/a	25.0
87	72	89	Exxon	120	130	60	-7.7
88	77	60	Recognition Equipment	117	112	131	4.1
89	n/m	n/m	L.M. Ericsson	115	n/a	n/a	n/c
90	n/m	n/m	Compaq	111	n/m	n/m	n/c
91	81	73	Commerce Clearing House	109	104	91	4.5
92	102	98	Cullinet Software	108	69	36	55.5
93	93	78	Interactive Data	105	82	81	28.0
94	98	95	Decision Data	103	74	50	39.7
95	94	88	Computer Consoles	103	79	60	30.9
96	95	89	Printronic	101	77	60	31.6
97	92	90	Floating Point Systems	100	86	57	15.7
98	103	93	General Datacomm Inds.	98	68	54	43.7
99	97	96	Nashua	97	74	50	30.6
100	101	99	Cipher Data Products	92	70	33	32.4
Summary				\$91,057	\$77,999*	\$63,923*	

(Continued from page G7)



pulted from virtually nowhere in 1982 to rank 90th. L. M. Ericsson, the Swedish giant that made its presence felt as an OEM in the United States for the first time, is also a notable newcomer. By acquiring Cado and STSC, telecommunications conglomerate Continental Telecomm (Con-

tel) thrust itself into the thick of dp's top performers. General Datacomm, manufacturer of an array of

data-communications products, and Cullinet Software, the software house that just missed inclusion on the 1982 list, also moved into the Top 100 this time around.

Leaving aside the extraordinary cases of Compaq and L.M. Ericsson, three corporations—Seagate, Contel, and Commodore—more than doubled their business between 1982 and 1983. That's half the number of revenue-doublers on the 1982 list. Interestingly, three of the Top 100 members boasting doubled revenues in 1982 came from the bottom half of the list, while only one of 1983's members—Contel—did. However, Contel's extraordinary dp growth is attributable solely to acquisitions. Compaq doesn't appear on this year's revenue-growth chart because it recorded no positive revenues in 1982. Of course, one may argue that Compaq's success will prove to be ephem-

(Continued on page G14)

Table 2

Comparing IBM to the Top 100

(Dollars in millions)

	1983 dp revenues	'83/'82 growth rate	1982 dp revenues	'82/'81 growth rate
IBM	\$37,367	18.7%	\$31,467	25.3%
No. 2 - No. 10	25,408	10.0	23,093	14.2
Top 10	62,775	15.0	54,560	20.4
No. 11 - No. 100	28,282	20.6	23,439	23.7
No. 2 - No. 100	53,690	15.3	46,532	18.8
Top 100	91,057	16.7	77,999	21.4

Table 3

The fast trackers

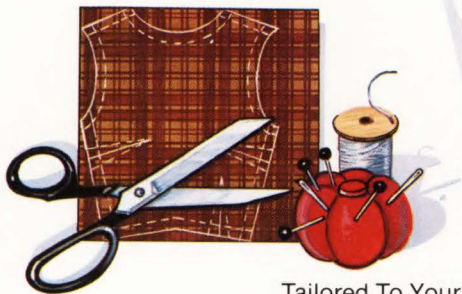
Top 20 in total dp-revenue-growth rate (Dollars in thousands)

	'83/'82 growth	Dp revenues		'83/'82 growth rate	
		1983	1982	U.S.	Foreign
Seagate	289.9%	\$222,020	\$56,940	354.7%	60.8%
Continental Telecomm	150.0	130,000	52,000	150.0	0
Commodore Int'l.	130.8	969,339	420,000	257.7	46.2
Tandon	94.2	343,885	177,053	103.0	20.6
Televideo Systems	71.2	168,718	98,530	69.0	78.7
Convergent Technologies	69.5	163,500	96,462	91.6	20.3
Amdahl	68.3	777,700	462,200	54.5	100.3
Apple Computer	63.4	1,084,705	663,800	75.6	31.4
Intergraph	61.9	252,000	155,642	72.4	40.9
Verbatim	60.3	147,378	91,933	81.0	-1.3
Management Assistance	57.9	559,212	354,174	23.4	100.0
Cullinet Software	55.5	108,358	69,691	59.4	36.2
United Telecommunications	50.0	222,000	148,000	52.9	28.2
3M	48.0	330,050	223,000	48.5	46.8
General Datacomm Inds.	43.7	98,492	68,517	55.8	21.7
Management Science America	43.4	145,176	101,224	48.4	27.2
First Data Resources	40.2	148,600	106,000	40.2	40.0
Decision Data	39.7	103,829	74,319	38.6	44.4
Dun & Bradstreet	36.4	150,000	110,000	0	36.4
Tandem Computers	36.1	450,516	330,949	38.6	30.4

Compaq is not listed as a "fast tracker" because a growth rate is not calculable. See Table 6 for Compaq's growth in absolute dollars.

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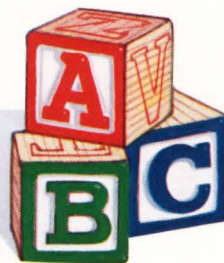
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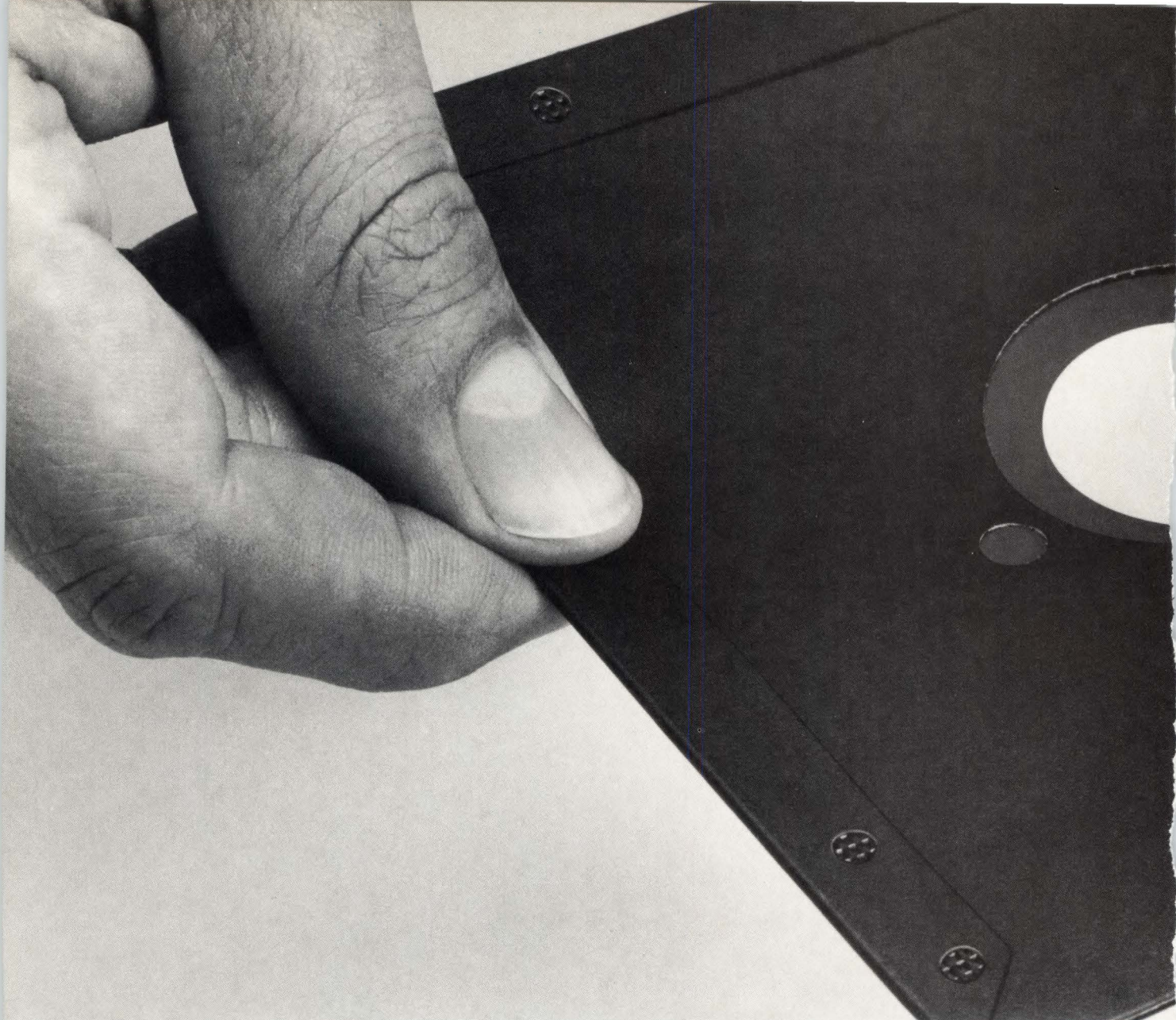


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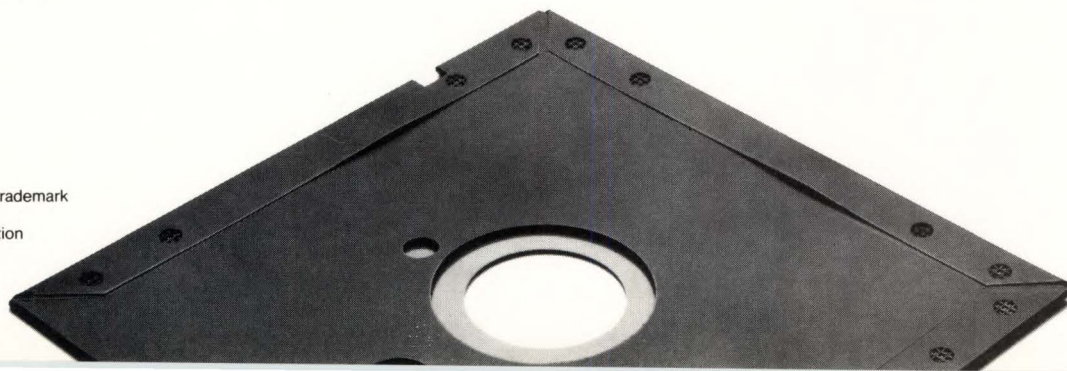
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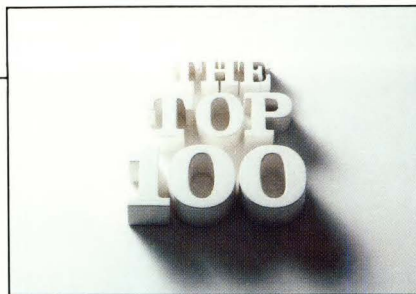
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CIRCLE 105



(Continued from page G10)



eral as IBM revs up its own portable, the Portable Personal Computer. Compaq is alone among PC-compatible vendors on the Top 100 list.

IBM increased its dp revenues by 18.7 percent in 1983, down from its 25.3 percent increase the previous year. On the other hand, the premier dp corporation captured more of the total dp-revenue pie in 1983 than it had in 1982—41 percent, up from 40.3 percent. (See Table 2.) For the second year in a row, IBM increased its market share, a trend that is likely to continue. The days when Big Blue would tolerate a slow but certain erosion of its market share appear to be over. About 93 percent of IBM's revenues now come from dp, up from 90 percent in 1982 and 87 percent the year before that. The other 99 vendors still managed a highly respectable 15.3 percent year-to-year gain.

In 1983, the Top 10 corporations accounted for 68.9 percent of the Top 100's total revenue from dp. That was down slightly from the 69.9 percent

they garnered in 1982. Unlike IBM, the Top 10 as a unit has accounted for an ever smaller portion of the revenue pie each year for the last five years. The Top 10 continues to grow at a slower pace than the Top 100 as a whole—its rate was 20.4 percent in 1982 and 15 percent last year.

Membership in the Top 10 has remained stable for two years, except for Wang's leapfrog over Honeywell into the eighth rank. Honeywell dropped one notch to the ninth position. Five members of the Top 10 are primarily vendors of mainframes: IBM, Burroughs, NCR, Sperry, and Honeywell. Three—Digital Equipment Corp. (DEC), Hewlett-Packard, and Wang—derived the bulk of their dp revenues from minicomputers. The two remaining firms, Control Data and Xerox, achieved their

exalted status primarily as OEMs. (Xerox' revenues from its Diablo Systems and Shugart operations exceed its revenues from its own office systems.) Of course, it could be argued that IBM is in a class by itself, deriving whopping revenues from sales of mainframes, as well as minis and microcomputers.

Industry-wide expansion during 1983 pushed more Top 100 corporations over the \$200 million plateau. Fifty-nine attained at least \$200 million in revenues last year, up

"The Top 100's gains are even more impressive in light of the disappointing first-half results many reported."

from 48 in 1982. In addition, all but three of 1983's Top 100 achieved more than \$100 million in dp revenues. Apple and TRW joined the billion-dollar club in 1983, bringing the number of Top 100 companies with dp revenues of over \$1 billion to 12, up from 11 in 1982. Storage Technology, after a horrendous year, fell from this exclusive club.

The movers and the shaken

Which dp stars were the prime movers last year? Aside from Compaq and Ericsson (neither of which appeared the 1982 list), OEMs captured the lion's share of spots on the list of companies with the 20 best rates of revenue growth (Table 3). Four OEM corporations, up from two the previous year, occupy spots on the Top 20 list in revenue-growth rate. They are: Seagate, Tandon, Televideo, and Convergent Technologies. Personal-computer vendors captured only two places on this list, down from six in 1982. This is probably evidence of the consolidation underway in the micro industry.

In terms of big moves up the Top 100 roster, for the second year in a row, Tandon led the pack, jumping 18 places to No. 36. Televideo, Con-

Table 4

The Bottom 20 in revenue-growth rate

	'83/'82 dp growth rate			'83 rank
	Total	U.S.	Foreign	
Storage Technology	-16.5%	-16.5%	-16.5%	16
Raytheon	-10.1	5.4	-56.5	42
Warner Communications	-9.4	-9.2	-10.0	44
Exxon	-7.7	-7.7	0	87
Northern Telecom	-7.2	0	-7.2	53
General Electric	-5.9	-4.2	-10.0	18
Harris	-5.0	-4.8	-6.2	41
Schlumberger	-4.5	-1.4	-16.9	70
Tymshare	-2.8	0	-2.8	43
Planning Research	-2.3	-2.2	-6.5	81
Honeywell	-1.1	.9	-6.6	9
Texas Instruments	-1.0	-10.8	47.6	20
Sperry	-.1	3.1	-4.6	6
Allied	0	0	0	62
ITT	0	0	0	46
Tektronix	.7	.3	1.0	37
Triumph-Adler	.9	2.3	-.7	40
Paradyne	1.3	1.3	1.4	56
Gould	2.8	2.8	2.8	38
Perkin-Elmer	3.2	-1.4	11.7	54



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vergent Technologies, United Telecomm, Intergraph, and Commodore International also performed well, leaping upward 16, 15, 14, 14, and 13 places, respectively. None of these gains matches the phenomenal growth of some of 1982's high-flyers, but they were impressive in a year of relative stability. Most of the Top 100 vendors hovered near their places on the 1982 list, or remained unchanged. Apple, which moved up eight places, also deserves to be singled out. Indeed, Apple and Commodore made advances near the top of the list, where a single upward step may represent more than \$50 million in revenue.

On the other hand, 13 companies actually saw their dp revenues decline during 1983, up from six in 1982. The corporations known as "the Bunch" (Burroughs; Univac, now known as Sperry; NCR; Control Data; and Honeywell) fared slightly better in 1983 than they did in 1982, when all but Burroughs appeared on the listing of the 20 poorest performers (see Table 4). This year, Honeywell and Sperry are the only Bunch members

included on the Bottom 20 list, and Honeywell registered fine operating profits. The Bunch companies continue to lose share of the Top 100 revenue pie to IBM, however. Their slice of the total was trimmed to 16.5 per-

"For the first time, IBM's revenues from personal-computer sales surpassed those of Apple Computer."

cent last year from 18.5 percent in 1982.

Other low-fliers were Texas Instruments, which pulled out of the home-computer business after suffering huge losses, and Warner Communications, which continues to lose on its home-computer line. Sperry, Honeywell, ITT, and Triumph-Adler made

the Bottom 20 for the fourth straight year. Storage Technology caps this list of unfortunates, having lost revenues at the rate of 16.5 percent. Warner's 9.4 percent loss is particularly tragic, considering that two years ago this vendor's dp operations exploded at the rate of 475 percent.

Big Blue thunders

In terms of dp revenues gained (Table 6), IBM again increased its treasure trove by a sum greater than all of No. 2 DEC's revenues. IBM is accustomed to pulling off this amazing feat—it has for five years running. Last year, IBM's revenue gain surpassed the total gain of the remaining Top 100 members. This year, however, IBM's \$5.9 billion missed that achievement by about \$800 million.

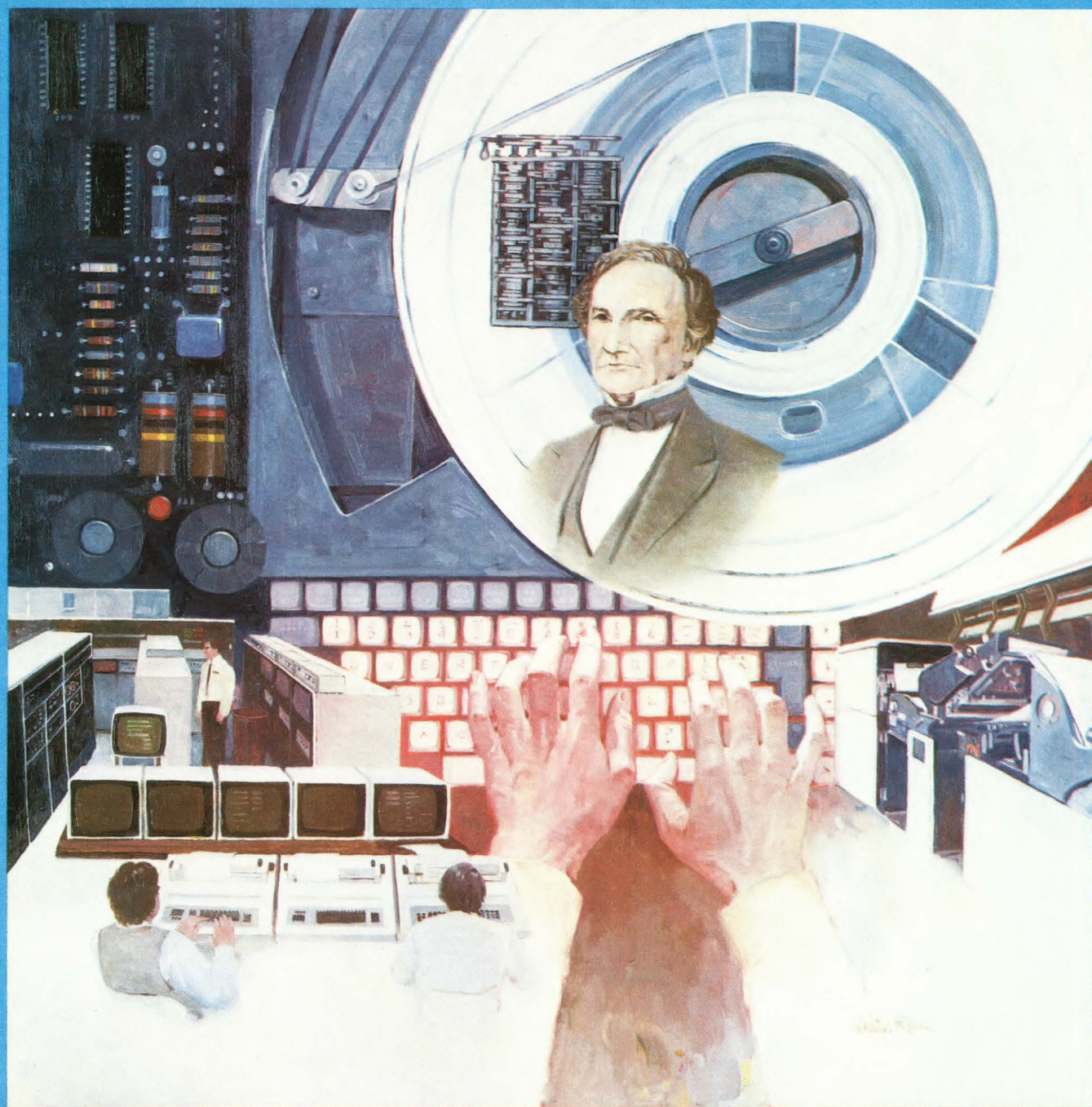
IBM announced several major products last year. The 4381 provided an air-cooled upgrade for 4341 users who previously had no alternative but to make the expensive move to water-cooled systems. The most significant announcements were the XT/370 and the 3270 PC, two personal computers

Table 5

Market-segment analysis of the Top 100 vendors in the dp industry

(Revenue dollars in millions)

	1983 dp revenues	1982 dp revenues	Change '83/'82
Mainframes (over \$250,000)	\$21,990	\$19,643	11.9%
Minicomputers (\$15,000-\$250,000)	12,034	10,633	13.2
Microcomputers (under \$15,000)	6,055	3,026	100.1
Word processing	3,072	2,472	24.3
Total Top 100 systems revenues	\$43,151	\$35,774	20.6%
Computer-aided design/manufacturing	\$1,559	\$1,299	20.0%
OEM peripherals	6,351	5,285	20.2
End-user peripherals	8,621	8,660	-.5
Data-communications hardware	2,700	2,051	31.6
Software	5,586	4,658	19.9
Services	8,482	7,735	9.7
Media	1,094	641	70.7
Maintenance	12,700	11,493	10.5
Other dp revenues	813	403	101.7
Total Top 100 support revenues	\$47,906	\$42,225	13.5%
Total Top 100 dp revenues	\$91,057	\$77,999	16.7%



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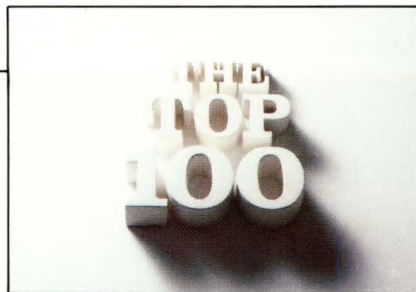
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designed for integration with IBM mainframe systems. These two products won't generate big-volume sales for Big Blue, but they are important because they expand the IBM Personal Computer line. Ultimately, the PC will become the base product of IBM's low-end line. Soon, IBM is expected to announce a token-passing local-area network that will wrap the entire IBM line of products for the office into interactive systems.

Mainframe sales on top

Following a long-standing trend, mainframe suppliers dominated the Top 100 in revenues broken down by product type (Table 5). After a surprising surge in 1982, however, growth in mainframe revenues returned to its historic rate of about 12 percent. Sales of minis, while growing faster than sales of mainframes, advanced at a slower rate last year than

in 1982. An anticipated upswing in the minicomputer market materialized, but too late to have an effect on the yearlong-performance figures.

Excluding the catchall category of "other dp revenues," the sale of microcomputers registered the fastest growth. Led by IBM and Commodore, micro sales accelerated at a rate of 100.1 percent, more than 15 percent faster than 1982's rapid growth rate. This rate of increase is particularly remarkable in light of the hemorrhage-like losses at Warner and Texas Instruments. Sales of OEM peripherals, buoyed by rosy economic conditions, grew 20.2 percent. Media, a new category in the market-segment breakdown this year,

experienced tremendous growth, at 70.7 percent, a reflection of dp vendors' expectations for solid demand during the coming months.

Systems revenues, including those generated by the sale or lease of mainframes, minis, micros, and word processors, came to \$43.15 billion in 1983, up 20.6 percent from the \$35.77 billion grossed the previous year. Sales of systems accounted for

"Hardware manufacturers are finding themselves forced to rely on the clever designs of software creators."

47.4 percent of total dp revenues. Interestingly, the annual growth rate of systems sales has remained steady in nominal terms for the past five years, never deviating more than a point from 20 percent. The growth rate of support-products revenues has been far more cyclical in recent years.

All this good news was somewhat counterbalanced by the first *decline* in any product category in the short history of this study. End-user-peripheral sales dropped half a percent in 1983, dragged down primarily by Storage Technology.

IBM: Master of profitability

IBM continues to reap the vast bulk of the profit harvest in dp. Big Blue earned an estimated \$8.19 billion in operating income from dp sales in 1983, up 13 percent from the estimated \$7.25 billion earned during the previous year. Thus, IBM earned more than 69 percent of the profits garnered by the Top 100, an increase over last year's 63 percent share. IBM's profitability is even more impressive considering that its share of the total dp market stands at 41 percent.

On the other hand, IBM fell from second to fifth place on the list ranking corporations by their dp operating margins (Table 7). Big Blue lost

(Continued on page G27)

Table 6

Top 20 in dp-revenue gain

(Dollars in thousands)

	Gain '83	Gain '82	'83/'82 growth rate
IBM	\$5,899,800	\$6,356,600	18.7%
DEC	807,823	432,400	20.1
Commodore Int'l.	549,339	244,000	130.8
Wang Labs.	470,700	312,987	35.6
Apple Computer	420,905	263,085	63.4
Amdahl	315,500	19,400	68.3
Hewlett-Packard	250,000	393,000	11.0
Burroughs	229,000	1,331,500	6.0
Tandy (Radio Shack)	220,100	265,000	30.4
Control Data	206,800	180,700	6.3
Management Assistance	205,038	5,106	57.9
NCR	202,000	124,000	7.1
TRW	190,000	-30,000	23.0
Xerox	172,000	178,300	16.4
Tandon	166,832	106,636	94.2
Seagate	165,080	56,940	289.9
Electronic Data Systems	138,974	75,001	25.0
Tandem Computers	119,567	88,477	36.1
L.M. Ericsson	115,000	n/m	n/m
Compaq	111,000	n/m	n/m

n/m = not meaningful

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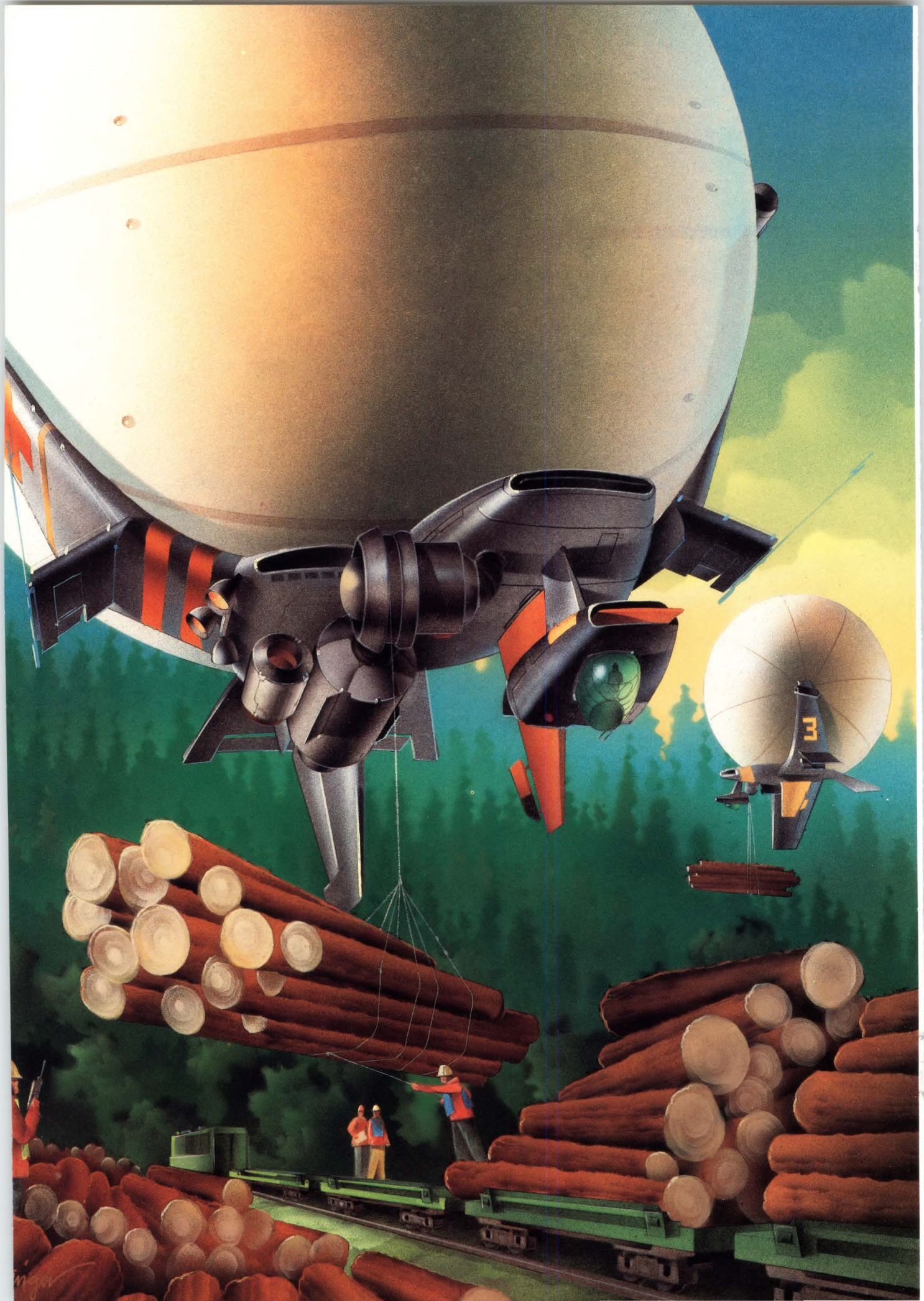
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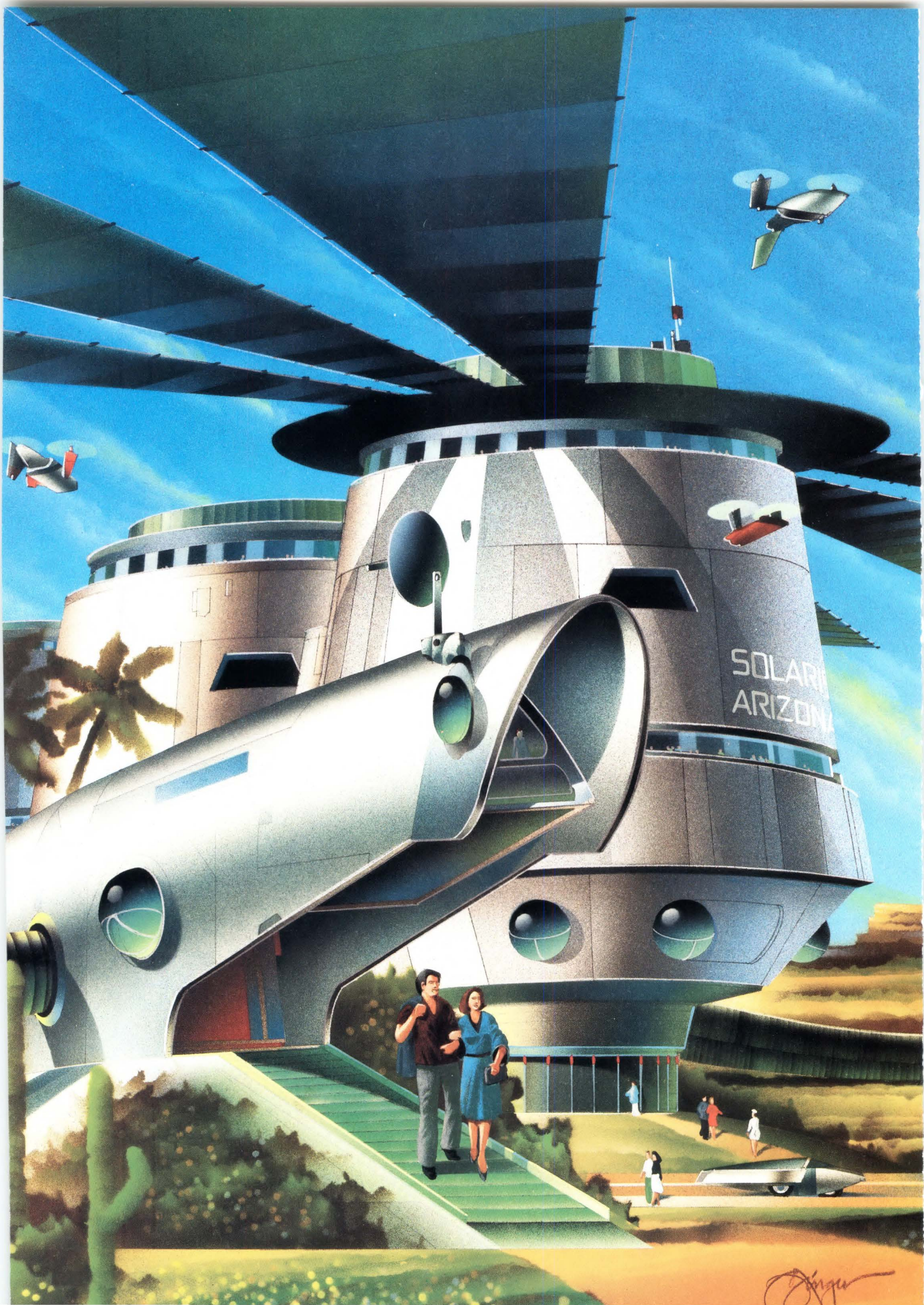
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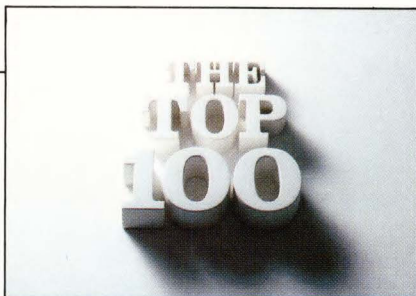
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(Continued from page G18)



a little more than a percentage point—21.9 percent, down from 23 percent. This year's finish on the operating-profit-margin listing suggests that the trimmings spurred by the last recession had a salutary effect on other parts of the industry. Quotron, Cray, Shared Medical Systems, and Telex—traditionally strong contenders in this category—passed the Armonk, NY-based giant with operating margins of 27.9 percent, 25.6 percent, 24.4 percent, and 23.6 percent, respectively. The big personal-computer vendors are noticeably absent from the Top 20 performers on the dp-operating-margins ranking. Apple and Tandy Corp. (manufacturer of the Radio Shack line) made the 1982 list. But as competition intensified last year, the margins of most micro vendors shrank. Commodore, No. 12 on the latest ranking, is the only exception.

Because of a combination of high profitability and large absolute prof-

its, IBM's results skew the industry-average figures, making data processing seem to be more profitable than it is for most of the industry's corporations. For the 82 Top 100 members that make up the basis for this statistic, the average operating margin was 9.3 percent. If weighted, the average profit margin becomes 13 percent, a clear indication of how IBM distorts the Top 100's profitability picture.

Recession's legacy

Overall dp employment, measured by 80 reporting members (representing 94 percent of the total revenues) of the Top 100 increased at the very modest rate of 4.6 percent. This rate of increase was significantly slower than the rate of revenue growth for

the same corporations, making 1983 the fifth year of increase in dp-employee revenue productivity (Table 8). For the first time in three years, C. Itoh Electronics failed to retain first place in the rankings for dp revenue per dp employee, ceding the top spot to Zenith Data Systems. C. Itoh dropped to second place. Except for C. Itoh, the revenue-per-employee statistic was up across the board among the 10 top finishers in this category—a legacy of the last recession with its big layoffs. Although it did not make the top half of this ranking, IBM revved up its dp-employee productivity to its highest level in five years.

Except in a few isolated cases—the resurgent mainframe vendor Amdahl and perennially healthy Commodore—foreign dp revenues grew at a significantly slower pace in 1983 than in the previous year (Table 11). Many corporations suffered declines in for-

(Continued on page G32)

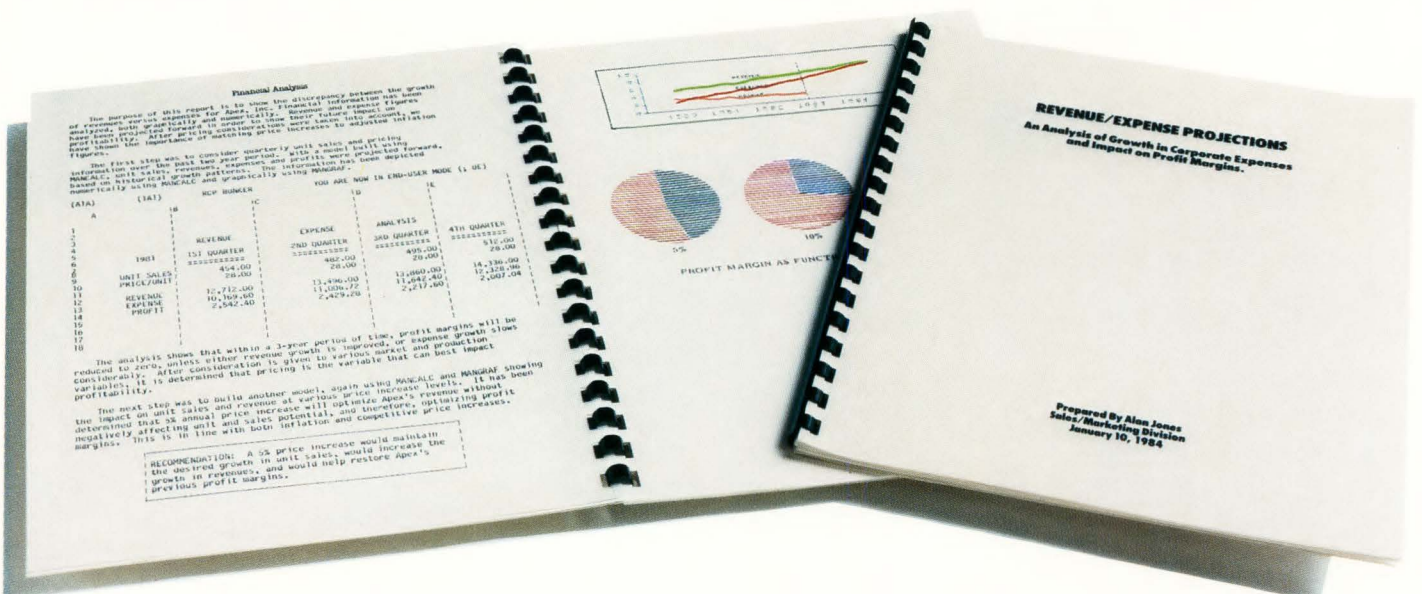
Table 7

Top 20 by operating margin (Dollars in thousands)

	Operating income		Operating margin		Change
	1983	1982	1983	1982	
Quotron	\$42,881	\$27,628	27.9%	22.8%	22.0%
Cray Research	43,398	32,251	25.6	22.8	11.9
Shared Medical Systems	51,424	41,024	24.4	24.7	-1.4
Telex	52,232	35,200	23.6	18.1	30.4
IBM	8,192,370	7,250,450	21.9	23.0	-4.8
Televideo Systems	36,752	25,482	21.8	25.9	-15.8
Intergraph	53,275	24,956	21.1	16.0	31.8
Cullinet Software	22,551	14,897	20.8	21.4	-2.6
Computervision	80,000	67,624	20.0	20.8	-3.8
Floating Point Systems	19,318	15,477	19.3	17.9	7.8
Nashua	18,100	9,400	18.5	12.6	47.4
Commodore Int'l.	173,510	74,000	17.9	17.6	1.6
Hewlett-Packard	430,000	370,000	17.1	16.3	4.7
Computer Consoles	17,610	9,952	17.0	12.6	35.2
Automatic Data Processing	127,000	111,000	15.6	15.6	-.2
Verbatim	22,466	14,946	15.2	16.3	-6.2
Convergent Technologies	24,688	18,207	15.1	18.9	-20.0
Seagate	33,484	10,510	15.1	18.5	-18.3
Schlumberger	24,800	25,000	14.8	14.3	3.9
National Data	18,808	n/a	14.7	n/a	n/m

n/a = not available n/m = not meaningful

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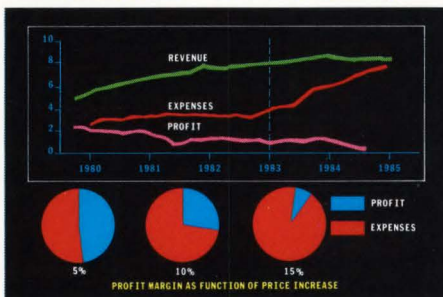
(In Canada: 416-279-4220)

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MANTEXT                                SECTION DAN LIB... DAN DOCU: JENNY
1      2      3      4      5      6      7
considerably. After consideration is given to various market and
production variables, it is determined that pricing is the
variable that can best impact profitability.

The next step was to build another model, again using MANCALC and
MANGRAF showing the impact on unit sales and revenue at various
price increase levels. It has been determined that a 5% annual
price increase will optimize Apex's revenue without negatively
affecting unit and sales potential, and therefore, optimizing
profit margins. This is in line with both inflation and
competitive price increases.
DOT 5.02
STR 10.60
1 RECOMMENDATION: a 5% price increase would maintain the desired
growth in unit sales, would increase the growth in revenues, and
would help restore Apex's previous profit margins.
DOT END
    
```

MANTEXT - Text Processing



MANGRAF - Business Graphics

(A)A1		(A)A1		RCP RUNNER		YOU ARE NOW IN END-USER MODE (UE)	
A	B	C	D	E	F	G	H
1							
2							
3							
4							
5							
6	1981	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER		
7							
8	UNIT SALES	454.00	482.00	495.00	512.00		
9	PRICE UNIT	28.00	28.00	28.00	28.00		
10	REVENUE	12,712.00	13,696.00	13,860.00	14,336.00		
11	EXPENSE	10,108.00	11,068.72	11,642.40	12,328.96		
12	PROFIT	2,604.00	2,627.28	2,217.60	2,007.04		
13							
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18							

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eign revenues. The reasons: the strength of the dollar overseas and the sorry state of most of the world's economies. With the dollar high, foreign currencies are down, encouraging the importation of foreign-manufactured dp products by this country. Imports of computers and computer-related products from the Far East exceeded exports for the first time last year, according to the federal government's 1984 Industrial Outlook report.

The Top 20 in terms of foreign revenues includes four corporations not found in the Top 20 overall: Management Assistance, Prime Computer, Tektronix, and Computervision. (Foreign-owned corporations like Ericsson and Nixdorf are represented in this analysis only by their United States operations.)

IBM's share of foreign dp revenues remained at its 1982 level of 49.3 percent, while the share of foreign dp revenues going to companies in the Bottom 50 continued its five-year history of contraction, sinking to a low of 2.4 percent in 1983. IBM's market share within the United States alone jumped to 36 percent last year, from 34 percent.

As product life cycles are shortened, leased equipment becomes a

burden for a vendor that is also trying to sell products. During the past five years, companies have reduced the percentage of their revenues generated via leases. In doing so, they've left the lease market to corporations that specialize in rentals. Leases accounted for 17.6 percent of the Top 100's total dp revenues last year, down from 19.3 percent the previous

"Conglomerates with dp operations had a rough time in 1983; many had flat dp earnings and some lost money."

year and 22 percent in 1981. Mainframe vendors, which historically lead the dp industry in lease revenues, show the steepest decline in this revenue category. Indeed, during the past four years, mainframe-lease revenues declined more sharply than those of the entire industry.

The most rapidly growing members of the Top 100 continue to rely on revenues generated by outright sales. Conversely, the slowest growing corporations derived the largest portion of their revenues from services

and maintenance.

Order rates for mainframes increased in 1983, with the greatest strength in the second half of the year. This trend will probably continue this year. More orders translate into higher shipments and improved revenues, improving prospects for many old-line mainframe manufacturers. All is not well, however. These corporations are attempting to diversify by moving into other, high-growth markets. But as they do, they will find themselves facing high, profit-sapping start-up costs. Moreover, diversifying corporations are moving into an already crowded marketplace. IBM dominates almost all aspects of data processing and at least one competitor occupies each market niche. There's not much room for new competitor companies to move into.

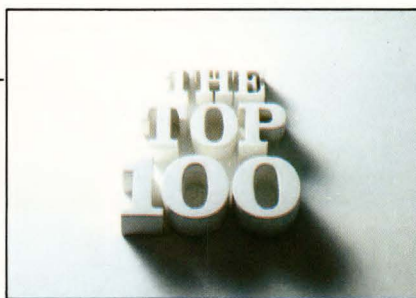
The plug-compatible mainframe makers had a good year. Both Amdahl and National Semiconductor are in the process of achieving compatibility with IBM's Extended Architecture (XA) and should begin shipping their IBM equivalents in quantity this year. They will probably be back in trouble by next year, however, as IBM's product line continues to evolve.

Table 8

Revenue-per-employee ranking (Dollars in thousands)

	Revenue per employee	Total employees	Operating income per employee	'83 dp revenue
1 Zenith	\$333.3	375	\$22.9	\$125,000
2 C. Itoh	316.1	1,140	n/a	360,300
3 NEC Information Systems	266.7	750	n/a	200,025
4 Apple Computer	236.7	4,582	20.5	1,084,705
5 Compaq	203.3	546	21.8	111,000
6 Nashua	195.4	500	36.2	97,700
7 Televideo Systems	194.6	867	42.4	168,718
8 Amdahl	194.4	4,000	n/a	777,700
9 Convergent Technologies	186.2	878	28.1	163,500
10 Motorola	182.3	2,820	-1.8	514,000
14 IBM	113.4	329,600	24.8	37,367,000

n/a = not available



As noted, the anticipated recovery of the minicomputer industry did not materialize until the last quarter of 1983. The mini manufacturers were severely pinched by IBM's aggressive price cutting and growing competition from micros. This year, however, many of these companies will benefit from cyclical growth as a result of increases in capital spending. They'll also benefit from the increasing use of minis to link and enhance personal computers.

IBM routs micro competitors

IBM solidified its position as the dominant personal-computer vendor in 1983. After several years of domination of this segment, Apple Computer took a back seat to Big Blue last year. DEC's attempt to ship what looked like a blockbuster personal computer foundered, and Warner Communications' Atari division made almost every blunder in the book on the way to gigantic losses. Only Commodore has emerged unscathed and poised for strong growth in its targeted home-computer market this year. The shakeout of micro makers will probably continue this year, with Apple emerging as the only dominant alternative to IBM and the manufacturers of PC-compatible machines, like Compaq. The Japanese presence in personal computers could significantly expand this year.

The home-computer boom is by no means about to end, and the potential revenues for enterprising vendors are huge. About 10 percent of American households have a personal computer. By the end of the decade, that figure may reach 80 percent. IBM has yet to demonstrate that it has clout in the home market, and neither Commodore, Apple, nor Tandy has the dominance IBM enjoys among business users. Moreover, the shakeout has severely cut the supply of personal computers for the home, and the situation isn't expected to stabilize until next year at the earliest. Results from this year should indicate which vendors among the Top 100 are capitalizing on the potential of the home-

computer market.

Last year was a year of watching and waiting in the office-systems business. However, positive trends are apparent in the year's results. The big office-automation vendors have finally begun to respond to user demands for integrated applications and information access. IBM, in particular, took major steps toward the integration of its office hardware (witness the release of Document Interchange Architecture/Document Content Architecture), and competitors in this segment of the industry have accepted IBM's role as standard-setter for the office. These trends will continue next year.

This year has all the earmarks of being a big one for the Top 100: The economy is strong and major corporate customers have increased capital

spending. Some industry segments will find this climate more fruitful than others. For example, vendors of computer-aided-design and -manufacturing (CAD/CAM) systems felt the effects of the last recession last year. CAD/CAM's growth rate declined to 20 percent from 25.3 per-

"Industry-wide expansion during 1983 pushed 59 Top 100 corporations over the plateau of \$200 million in revenues."

cent in 1982. However, as corporate capital spending rises, CAD/CAM suppliers should return to their formerly high-flying growth rates—perhaps as high as 40 percent this year.

Peripherals and media should also continue to grow briskly in 1984, fueled by the growth of the personal-

Table 9

Top 20 by dp operating income

(Dollars in thousands)

	1983	1982	Change
IBM	\$8,192,370	\$7,250,450	13.0%
Hewlett-Packard	430,000	370,000	16.2
NCR	386,554	398,022	-2.9
Burroughs	361,500	248,100	45.7
DEC	338,100	668,078	-49.4
Sperry	278,300	233,700	19.1
Wang Labs.	251,300	185,000	35.8
Control Data	234,800	242,000	-3.0
Commodore Int'l.	173,510	74,000	134.5
Honeywell	130,800	79,800	63.9
Automatic Data Processing	127,000	111,000	14.4
Apple Computer	94,042	120,042	-21.7
Electronic Data Systems	87,646	73,975	18.5
Computervision	80,000	67,624	18.3
TRW	69,500	69,000	.7
Tandem Computers	55,012	40,991	34.2
Intergraph	53,275	24,956	113.5
Telex	52,232	35,200	48.4
Shared Medical Systems	51,424	41,024	25.4
Prime Computer	50,965	68,628	-25.7

computer segment. Supplies have begun to catch up to demand, however, creating far more treacherous conditions for vendors.

For both software and service vendors, the outlook for 1984 is universally bright. The key technology trends that have spurred the growth of these segments—declining hardware prices, a shortage of skilled programmers, and increasing end-user computing—should continue to accelerate. Combined with the strength of the economy, these factors will ensure solid performances from the software and services segments of the industry.

The fortunes of software vendors are being enhanced by the effects of the computer's penetration of the workplace and the home. As they learn more about computers, users are losing patience with the arcane ways of hardware "techies" who are concerned more with technical el-

egance and efficiency than with ease of use. Thus, hardware manufacturers are finding themselves forced to rely more and more on the clever designs of software creators for new, easier-to-use applications.

A specialist's game

Data processing is evolving into a specialist's game. The large conglomerates with dp operations had a bad time of it in 1983; many had flat dp earnings and some lost money (Table 12). After explosive growth in 1982, corporations whose dp operations account for less than 25 percent of their total revenues grew at the anemic rate of 4 percent. The poor track record of the conglomerates—combined with dp's potential

sensitivity to trends in the economy—has halted the acquisition of dp subsidiaries by non-dp corporations. Some of these conglomerates have even begun to shed their dp operations.

Many telecommunications vendors are an exception to this rule, but they

"Big office-automation vendors have finally begun to respond to user demands for integrated applications."

are special cases. Deregulation is having a profound effect on the structure of the dp and telecommunications industries. Technology is being allowed to follow its natural course toward a blurring of the border be-

(Continued on page G38)



Table 10

Top 20 in U.S. dp revenues

(Dollars in thousands)

		1983 U.S. revenues	Percent of total dp revenues	1982 U.S. revenues	Change '83/'82	Top 100 rank
1	IBM	\$21,546,042	57.7%	\$16,363,152	31.7%	1
2	DEC	3,040,898	63.0	2,411,400	26.1	2
3	Control Data	2,434,100	69.4	2,235,800	8.9	4
4	Burroughs	1,997,400	49.5	1,823,300	9.5	3
5	Sperry	1,686,500	60.2	1,635,900	3.1	6
6	NCR	1,640,000	53.9	1,410,000	16.3	5
7	Hewlett-Packard	1,510,000	60.0	1,170,720	29.0	7
8	Wang Labs	1,285,700	71.7	913,525	40.7	8
9	Honeywell	1,235,300	74.1	1,224,000	.9	9
10	Xerox	1,048,100	85.7	918,800	14.1	10
11	TRW	1,015,000	100.0	825,000	23.0	12
12	Apple Computer	843,704	77.8	480,396	75.6	11
13	Tandy (Radio Shack)	744,000	78.7	583,000	27.6	14
14	Automatic Data Processing	742,300	91.0	648,000	14.6	17
15	Electronic Data Systems	659,874	95.0	536,006	23.1	22
16	Storage Technology	639,000	74.3	765,000	-16.5	16
17	Computer Sciences	602,845	83.9	562,804	7.1	21
18	Commodore Int'l.	600,867	62.0	168,000	257.7	13
19	Data General	581,200	67.0	528,700	9.9	15
20	General Electric	575,000	71.9	600,000	-4.2	18
Summary		\$44,427,830		\$35,803,503	24.1%	

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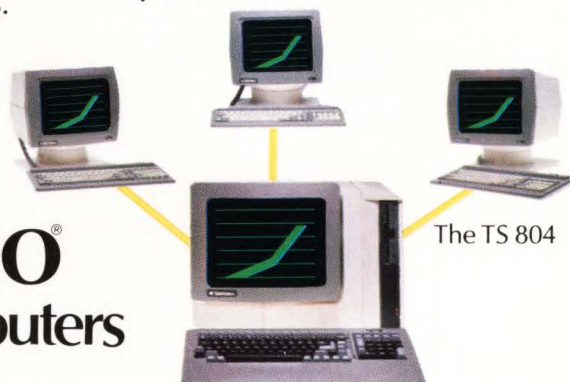
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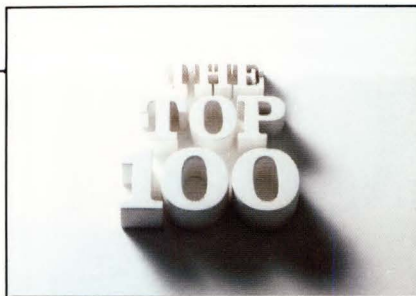
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tween dp and communications. Companies that have grown up on one side of the border have been forced to diversify their product offerings, either through internal development (AT&T's approach), acquisitions (like Contel), or partnerships and other special relationships with other vendors (like the IBM and Rolm deal).

It is still too early to make predictions, but both industries are certainly changing. AT&T, in particular, stands at the crossroads. Saddled by a corporate culture shaped during decades of government regulation, the telecommunications giant has yet to prove its ability to prosper or survive the rigors of competition. So far, its actions have not demonstrated that AT&T has a firm grasp of the realities of the marketplace. However, there's no question that AT&T's financial might and reputation for quality are big pluses. If AT&T can

rid itself of internal inertia, it may become a formidable competitor for IBM.

The Japanese penetration of the American market proceeds apace. For two years, the United States has had a trade deficit with Japan in the shipment of computers and related products. In 1983, the gap was so large it accounted for the United States' overall computer-trade deficit with the Far East. However, fears that the Japanese are grabbing the lead in advanced computer technology may be exaggerated. In particular, reports that Japanese researchers have equaled the performance of the Cray XMP supercomputer could turn out to be a red herring. In general, the Japanese probably won't be

serious competitors in mainframes under their own names until the end of the decade. The Japanese vendors simply don't have the support and service networks necessary to sustain a drive to grab a big chunk of the American market.

The low end of the market is quite

"Except in isolated cases, foreign dp revenues grew at a much slower pace in 1983 than in the previous year."

another matter. The Japanese corporations' ability to supply low-cost, high-quality products will soon propel "Japan Inc." into the forefront of the personal-computer and peripherals markets. Japanese vendors will be formidable competitors for Ameri-

Table 11

Top 20 in foreign dp revenues (Dollars in thousands)

		1983 foreign revenues	Percent of total dp revenue	1982 foreign revenues	Change '83/'82	Top 100 rank
1	IBM	\$15,821,358	42.3%	\$15,104,448	4.7%	1
2	Burroughs	2,041,100	50.5	1,986,200	2.8	3
3	DEC	1,785,925	37.0	1,607,600	11.1	2
4	NCR	1,400,000	46.1	1,428,000	-2.0	5
5	Sperry	1,113,100	39.8	1,167,000	-4.6	6
6	Control Data	1,073,800	30.6	1,065,300	.8	4
7	Hewlett-Packard	1,008,000	40.0	1,097,280	-8.1	7
8	Wang Labs.	506,500	28.3	407,975	24.1	8
9	Honeywell	430,800	25.9	461,000	-6.6	9
10	Commodore Int'l.	368,472	38.0	252,000	46.2	13
11	Management Assistance	318,751	57.0	159,379	100.0	23
12	Data General	285,910	33.0	275,120	3.9	15
13	Amdahl	277,700	35.7	138,630	100.3	19
14	Apple Computer	241,001	22.2	183,404	31.4	11
15	General Electric	225,000	28.1	250,000	-10.0	18
16	Storage Technology	221,390	25.7	265,000	-16.5	16
17	Prime Computer	208,414	40.4	188,458	10.6	26
18	Tektronix	203,072	60.0	201,000	1.0	37
19	Tandy (Radio Shack)	201,100	21.3	142,000	41.6	14
20	Computervision	196,000	49.0	161,200	21.6	31
Summary		\$27,927,393		\$26,540,994	5.2%	

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can vendors weakened by the struggle with IBM.

IBM, of course, will continue to dominate the dp business for the foreseeable future. The overall distribution of revenues by company demonstrates that the computer market is an oligarchy, with the top few companies generating most of the revenues. Even with IBM removed, only a few companies control the majority of industry revenues. It's unlikely that this distribution of power and wealth will change. IBM calls the tune for the industry and all other vendors dance. The only exceptions are suppliers that established a presence in many sites early in the development of a particular industry



segment or those that have been successful in specialized markets.

In general, coexistence with IBM is a fact of life for the rest of the Top 100. That may mean no more than supporting IBM communications protocols or as much as offering plug-compatible products. Each strategy has its attendant rewards and risks, not the least of which is IBM's decision to exploit a market niche previously left to a smaller vendor. The dp industry is becoming littered with the corpses of small ambitious com-

panies that took on IBM one-on-one.

Nonetheless, data processing has traditionally been fertile ground for small companies, and that's unlikely to change in the future. Indeed, signs point to the emergence of a second tier of vendors below the Top 100. Led by independent software houses, the roster of vendors in this tier has begun to grow larger. In the future, consideration of their annual performances and results will be important to understanding the state of the dp industry's health and wealth. □

Gartner Group defines dp revenues as those revenues generated by the sale, lease, or service of dp hardware

Table 12

Top 100 vendors with less than 25 percent of revenues from dp (Dollars in thousands)

		Percentage dp in '83	Primary sector	'83 dp revenues	Top 100 rank
1	Exxon	.1%	Word processing	\$120,000	87
2	ITT	1.3	OEM peripherals	265,000	46
3	Allied	1.9	Minicomputers	195,000	62
4	Boeing	2.4	Service	275,000	45
5	Signal Companies	3.0	End-user peripherals	180,000	65
6	General Electric	3.0	Service	800,000	18
7	Schlumberger	3.0	CAD/CAM	167,100	70
8	Martin Marietta	3.8	Service	149,400	76
9	3M	4.7	Media	330,050	39
10	Raytheon	5.1	End-user peripherals	302,000	42
11	Continental Telecomm	6.2	Microcomputers	130,000	84
12	McDonnell Douglas	6.5	Service	542,500	25
13	Grumman	7.0	Service	157,000	72
14	Warner Communications	8.2	Microcomputers	281,000	44
15	Northern Telecom	8.3	Minicomputers	220,000	53
16	United Telecommunications	8.8	End-user peripherals	222,000	51
17	Zenith	9.2	Microcomputers	125,000	86
18	Dun & Bradstreet	9.9	Service	150,000	75
19	Motorola	11.9	Data-comm hardware	514,000	27
20	Xerox	14.5	OEM peripherals	1,222,300	10
21	Texas Instruments	16.1	Minicomputers	739,000	20
22	Nashua	17.3	OEM peripherals	97,700	99
23	TRW	18.5	Software	1,015,000	12
24	Perkin-Elmer	20.1	Minicomputers	213,933	54
25	General Instrument	21.5	Service	191,851	64
26	Harris	22.4	End-user peripherals	327,600	41

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activity. Report provides transaction code, terminal, abend code, program name and date /time information for all abends.

Greater Flexibility

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or software or the provision of a dp service. Revenues are counted for the 12 months ending Dec. 31, 1983. Included are all systems hardware, such as mainframes, minis, micros above the sub-\$100 class, word-processing and other office-systems hardware, OEM and end-user peripheral gear, data-communications equipment such as modems and multiplexers, disk and tape media, CAD/CAM systems, software, and maintenance.

Specifically excluded are services related to common-carrier communications, electric and electronic typewriters, electronic cash registers, instrumentation, semiconductors, board-level computers, printed circuit boards, automatic test gear, PABX-type switching equipment, forms, and paper, as well as compa-

nies engaged primarily in leasing (to avoid double-counting IBM's revenues), and revenues from retail operations like Computerland.

Gartner Group maintains a database of these statistics that is periodically restated; thus, figures for earlier years reported in 1983's listings may not precisely agree with previously published figures. In particular, comparisons with 1982 figures may differ from previously published data. Gartner Group also restates the revenues of vendors that are not on a December fiscal year; in the event a corporation has an unusual fiscal year (ending in No-

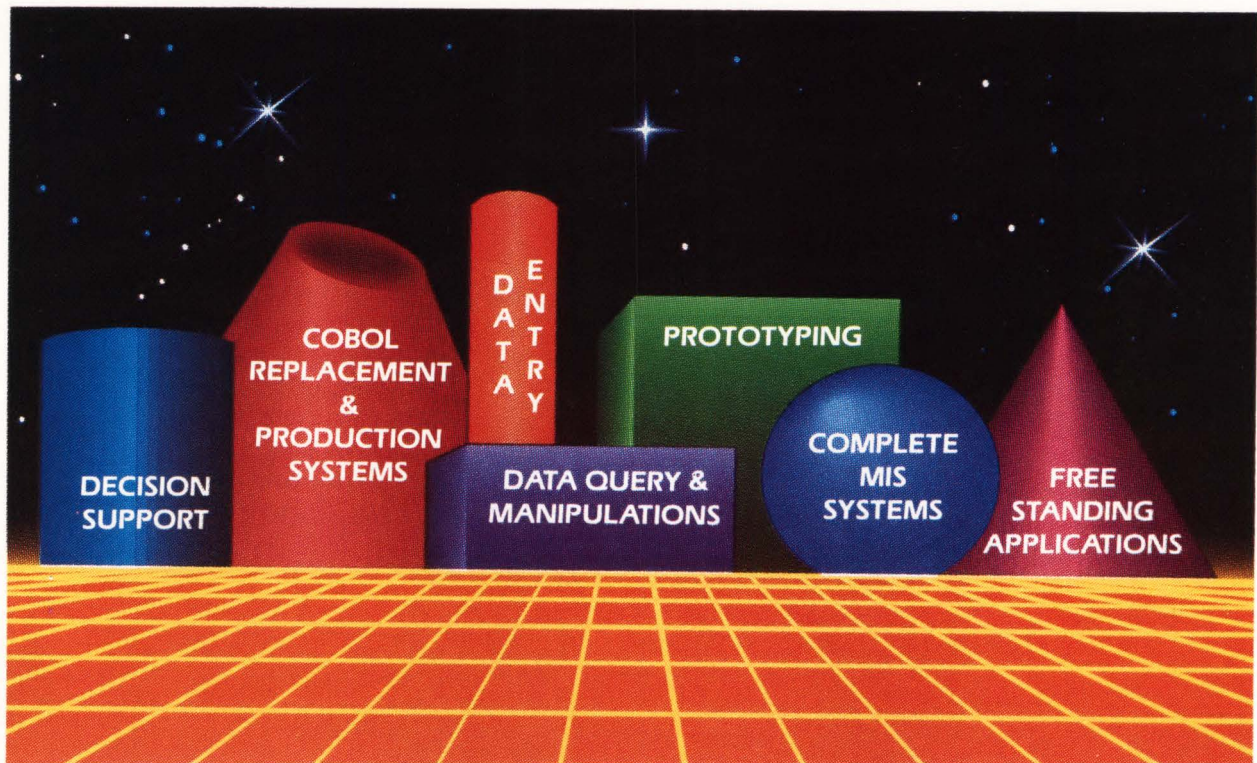
vember, for example), the four quarters of data ending closest to December are used. Where companies are closely held or are conglomerates, Gartner Group offers its best estimate of the applicable revenues. Vendors that should be included may be missed.

Gartner Group will publish a detailed compilation of these data in early summer. This book will contain more than 100 cross-section charts and analyses of the structure of the dp industry by company, product, and financial concept. For a brochure on this reference work, circle No. 798 on the Reader-Service Card at the back of the June issue of Computer Decisions or contact William Cappelli, Gartner Group, 72 Cummings Point Rd., Stamford, CT 06902, (203) 964-0096.

Index to corporations in the Top 100

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Boeing.....	45	Harris.....	41	Recognition Equipment.....	88
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Centronics Data.....	67	Honeywell.....	9	Sanders.....	57
Cipher Data Products.....	100	IBM.....	1	Schlumberger.....	70
C. Itoh.....	34	Informatics General.....	60	Seagate.....	50
Commerce Clearing House.....	91	Interactive Data.....	93	Shared Medical Systems.....	55
Commodore Int'l.....	13	Intergraph.....	47	Signal Companies.....	65
Compaq.....	90	ITT.....	46	Sperry.....	6
Computer Consoles.....	95	Lanier Business Products.....	49	Storage Technology.....	16
Computer Sciences.....	21	L. M. Ericsson.....	89	Tandem Computers.....	29
Computervision.....	31	M/A Com.....	61	Tandon.....	36
Continental Telecomm.....	84	Management Assistance.....	23	Tandy (Radio Shack).....	14
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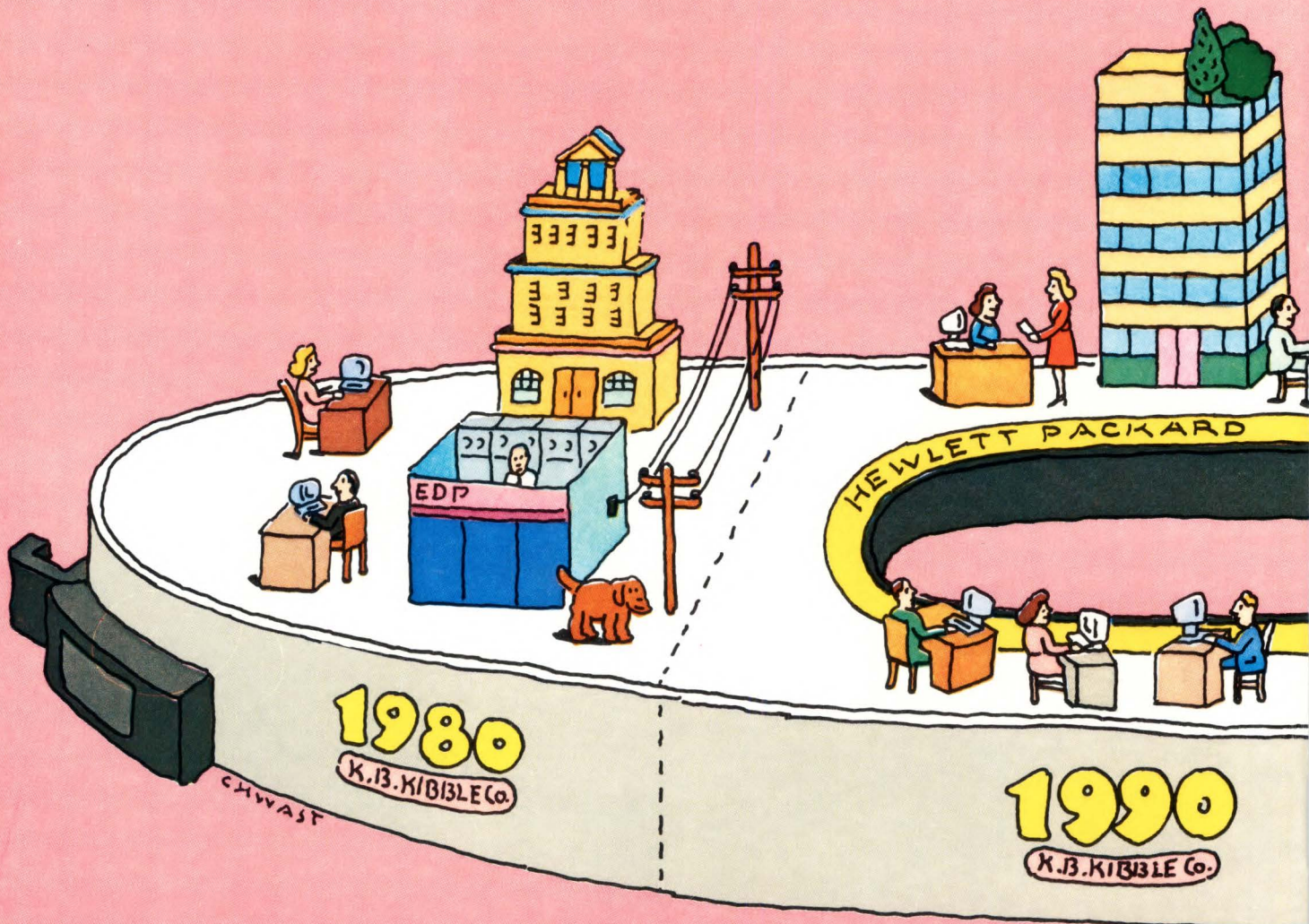
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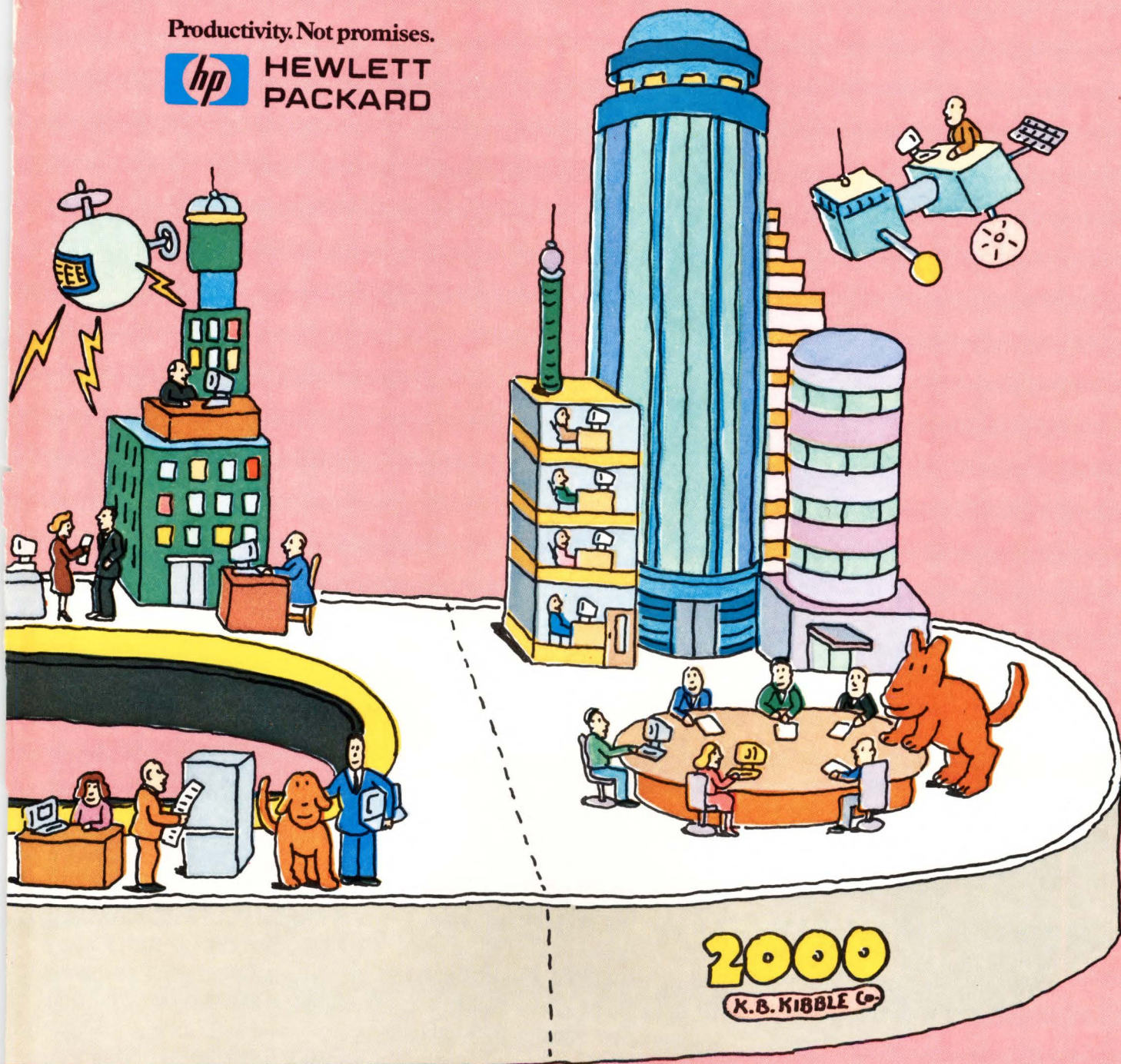
Dept. 027193, 19055 Pruneridge Avenue, Cupertino,
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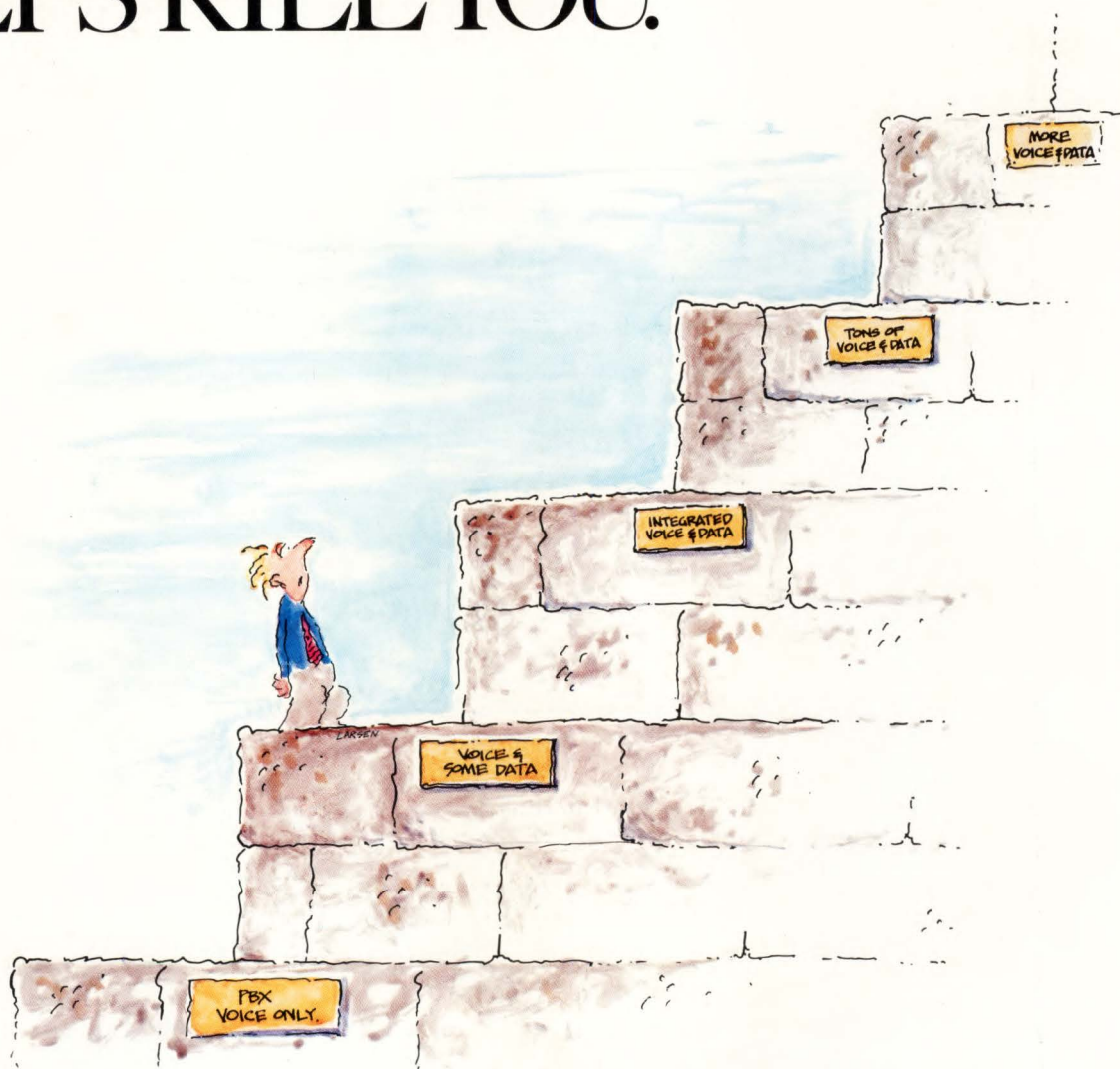


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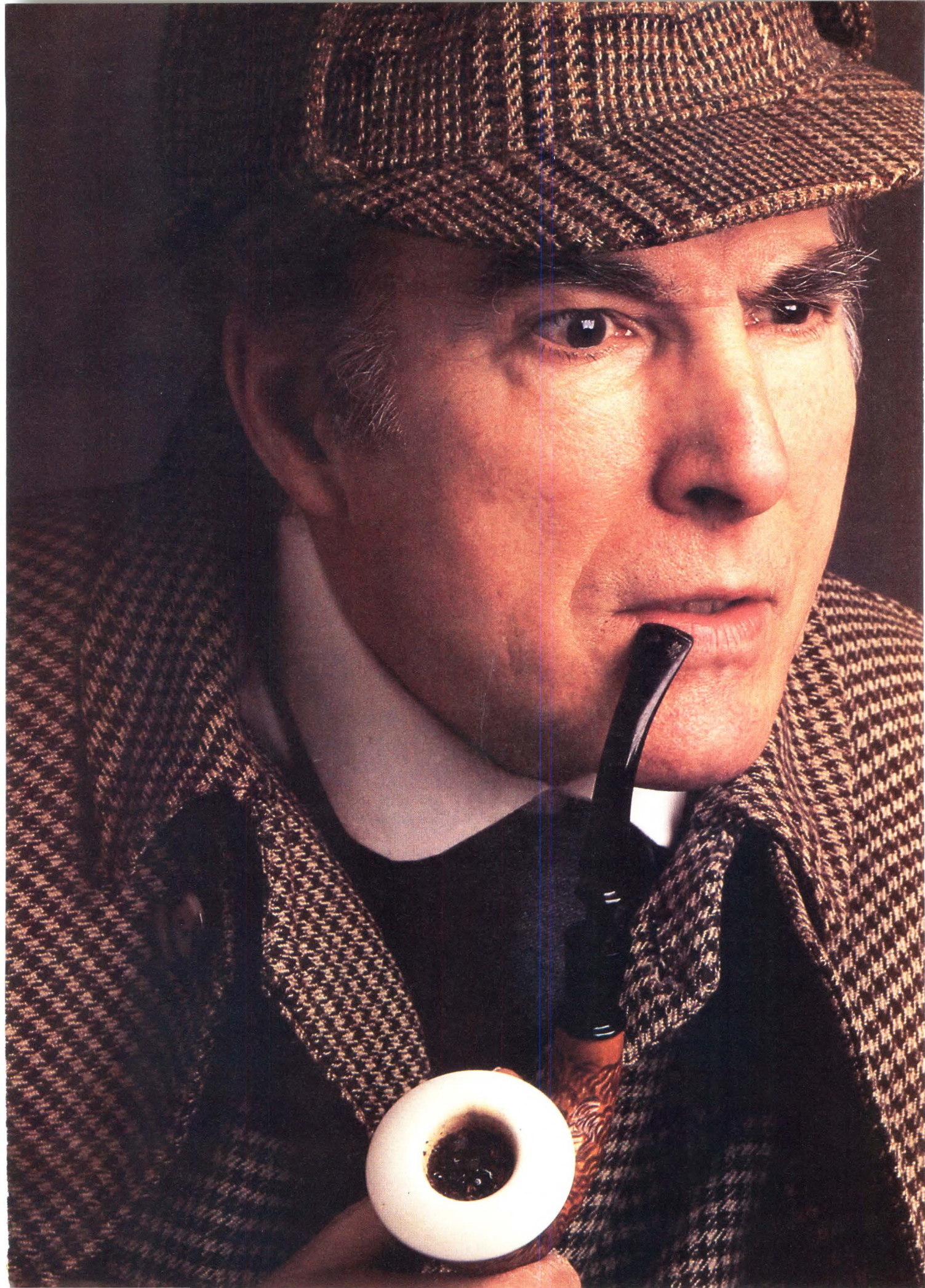
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In Pursuit Of Word Processing Software

You have to do some sleuthing to make sure the word-processing package you buy is everything your organization needs.

by David Roman, Staff Writer

A word-processing package may offer less than meets the eye—and it's difficult to tell which packages give your users the most for the corporate dollar. For example, more than two

score word-processing packages are available for the IBM Personal Computer, but don't assume they're all alike. Some are bare-bones letter writers while others offer opulent text-editing features. Some vendors sell packages that include spelling verifiers or mailing-list managers, while others charge you extra for those capabilities. Still others don't offer added features at any price.

The same is generally true for all mini- and personal-computer word-processing packages. What appears on the following pages is a series of leads for software hunters. It's up to you to track down the goods. The more than 50 packages available for the IBM PC and PC-compatibles appear on the first list. Many of these packages, along with the packages on the second list—which includes word-processing packages for non-IBM personal computers—can be purchased at retail computer stores. But since no store offers all 122 of the packages listed here, you may have to contact the vendor directly to get information on a particular product.

The spelling verifiers and supplementary software packages described in the next two lists are mostly for personal computers, although some work with minicomputer word-processing packages. Word-processing software for minicomputers comprises the last two lists. The companies that control the distribution of these packages can refer you to the distributor in your area.

Some of the integrated software packages available for personal computers (which are not listed here) have word-processing capabilities. So if you want graphics, a spreadsheet, or a database along with word processing, you should include those packages in your search. (A detailed discussion and listing of integrated packages will appear in the September issue.)

WP Software

(Continued from page 177)

Wp packages for the IBM Personal Computer (and compatibles)

Vendor	Package	Price	Circle
Broderbund Software (415) 479-1170	Bank Street Writer	\$70	401
Beaman Porter (914) 987-3504	Powertext (Requires p-System)	\$399	402
Bruce & James (415) 775-8400	Wordvision	\$80	403
Computing! (415) 567-1634	Docupower!	\$149	404
Compuvision Products (313) 996-1299	Vedit	\$150	405
Cullinet Software (617) 329-7700	Goldengate	\$1,000	406
Economic Insights (301) 258-5235	World Writer Techni-Word	\$595 \$595	407
EEC Syst. (617) 258-7781	Lex-11	\$500	408
Friendlysoft (817) 277-9378	Friendlywriter	\$70	409
Harris Micro Computers (801) 373-1605	Paperwork	\$130	410
Hayden Software (617) 937-0200	The Writer	\$200	411
Ideaware (212) 334-8043	Idea Processor	\$295	412
IJG (714) 982-7829	Electric Pencil	\$299	413
Information Unltd. Software (415) 331-6700	Easywriter II System	\$395	414
Lifetree Software (408) 373-4718	Volkswriter Volkswriter Deluxe	\$195 \$295	415
Marc Software Int'l. (415) 326-1971	Wordmarc	\$495	416
Mark of the Unicorn (617) 576-2760	Final Word Mince	\$300 \$175	417
Megahaus (619) 450-1230	Megawriter	\$100	418
Micro Architect (617) 273-5658	Word/X	\$59	419
Micropro Int'l. (415) 499-1200	Wordstar	\$495	420
Microsoft (206) 828-8080	The Word	\$375	421
Microsystems Engineering (312) 882-0111	Mass-11	\$995	630
Miller Microcomputer Svcs. (617) 653-6136	Forthwrite	\$175	422
Multimate Int'l. (203) 522-2116	Multimate	\$495	423
NBI (303) 444-5710	NBI Word Processing	\$695	424



Wp packages for the IBM Personal Computer (and compatibles)

Vendor	Package	Price	Circle
Nemco (201) 933-4933	Word Flex	\$35	425
Newstar Software (415) 932-2278	Newword	\$249	426
Norell Data Syst. (213) 257-2026	Easyword	\$150	427
Palantir Software (713) 520-8221	Palantir	\$395	428
Peachtree Software (404) 262-2376	Peachtext Peachtext 5000	\$250 \$395	429
Perfect Software (415) 527-2626	Perfect Writer	\$349	430
Pinnacle Software Syst. (303) 224-5061	Superlist Manager	\$249	431
R Syst. (214) 343-9188	R Word	\$395	432
Rio Grande Software (319) 627-2272	RGS Word	\$395	433
Samna (404) 321-5006	Samna Word II Samna Word III	\$450 \$650	434
Satellite Software Int'l. (801) 224-8554	Word Perfect	\$495	435
Select Information Syst. (415) 459-4003	Select: The Word Processor Select Bilingual Select Write	\$295 \$395 \$99	436
Sof/Sys (612) 929-7104	Executive Secretary Personal Secretary	\$295 \$80	437
Software Publishing (415) 962-8910	PFS: Write	\$140	438
Sorcim (408) 942-1727	Superwriter	\$295	439
Structured Syst. Group (415) 547-1567	Word Right	\$495	440
Texasoft (214) 369-0795	Versatext	\$200	441
Visicorp (408) 946-9000	Visiword Plus	\$375	442
Westerly Business Syst. (401) 596-1811	WES	\$395	443
Xyquest (617) 275-4439	Xywrite I Xywrite II Xywrite III	\$50 \$195 \$295	444

WP Software

(Continued from page 179)

Wp packages for other personal computers

Vendor	Package	Requirements	Price	Circle
A.B. Computers (215) 822-7727	Page Mate	Commodore 64	\$25	445
Action-Research Northwest (206) 241-1645	Zardax	Apple IIe, II Plus, and III	\$210	446
Alphabit Communications (313) 581-2896	Lazywriter	TRS-80 Models I, III, and 4; Lobo Max-80; LNW	\$175	447
Alternate Source (517) 482-8270	EDX	TRS-80 Models I, III, and 4	\$30	448
Applied Microcomputer Syst. (603) 367-8004	Documate	HP-83 and HP-85	\$395	449
Applied Research (303) 663-3223	Write 85	HP Series 80	\$300	450
	Write 86	HP Series 80	\$350	
Artsci (213) 985-2922	Magic Window I	Apple IIe, II Plus	\$100	451
	Magic Window II	Apple IIe, II Plus	\$150	
ATS Data Processing (904) 433-7578	Digitext	DEC Pro 350	\$999	452
Beaman Porter (914) 987-3504	Powertext	Apple III under p-System with Pascal	\$199	453
		Apple IIe and II Plus under p-System with Pascal	\$299	
Benchmark Software (602) 961-0003	Benchmark Word Processor	Systems under MS-DOS	\$395	454
Bluebird Syst. (619) 438-2220	Word Manager	Systems under Super-DOS	\$695	455
Broderbund Software (415) 479-1170	Bank Street Writer	Apple IIe and II Plus; Commodore 64	\$70	456
Business Solutions (516) 269-1120	Incredible Jack	Apple IIe, II Plus	\$179	457
Cardco (316) 267-6525	Write Now (cartridge)	Commodore 64	\$50	458
Chang Labs (408) 246-8020	Memoplan	Systems under CP/M or MS-DOS	\$195	459
CMA Microcomputers (619) 365-9718	Docuwriter	Apple IIe, II Plus	\$70	460
		Apple IIe, II Plus with hard disk	\$80	
		Apple III	\$90	
		Apple IIe, II Plus	\$60	
	Master Text Processor	Apple IIe, II Plus	\$60	
		Apple IIe, II Plus	\$60	
		Apple IIe, II Plus	\$50	
	Personal Text Processor	Apple IIe, II Plus	\$50	
		Apple IIe, II Plus	\$50	
Computer Mktg. Svcs. (609) 424-5055	Script 64	Commodore 64	\$100	461
Computing! (415) 567-1634	Docupower!	Systems under CP/M or CP/M-86	\$149	462
Compu-Tome (213) 796-9371	CTOS	DEC Pro 350 and systems under CP/M	\$950	463
Compview Products (313) 996-1299	Vedit	Systems under CP/M, CP/M-86, MP/M, MP/M-86, MS-DOS, ZDOS, CDOS, or Concurrent CP/M	\$150 to \$195	464
Concept Omega (201) 722-7790	Word Concept	Systems under MS-DOS, Unix, Xenix, or Thoroughbred	\$495	465



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WP Software

(Continued from page 180)

Wp packages for other personal computers

Vendor	Package	Requirements	Price	Circle
Data Base Industries (619) 480-9616	Gold Letters/ Gold Writer	Systems under CP/M CP/M-80, CP/M-86, MP/M, or MS-DOS	\$159	466
Data Processing Design (714) 993-4160	Word-11	DEC Pro 350	\$595	467
Datasoft (213) 701-5161	Text Wizard	Commodore 64	\$50	468
Dezoysa Enterprises (201) 739-1981	Letter/Report Writer Program	TRS-80 Models I, III, and 4	\$22.50 (cassette) \$27.50 (disk)	469
Dimis Micro Syst. (201) 531-2300	Benchmark	Systems under CP/M	\$500	470
Dynacomp (716) 442-8960	Text Master	Apple IIe, II Plus, and III	\$50	471
EEC Syst. (617) 358-7781	Lex-11	DEC Pro 350 DEC Rainbow	\$850 \$550	472
Emerging Tech. Consultants (303) 447-9495	Edix Wordix	Systems under MS-DOS Same systems	\$195 \$195	473
Exact Syst. and Programming (914) 273-8100	Word-base	Data General personal computers with DNA-4	\$1,250	474
Foxware Products (801) 364-0394	Ink Well	Apple III	\$185	475
Harris Micro Computers (801) 373-1605	Paperwork	Systems under CP/M-80	\$130	476
Hayden Software (617) 937-0200	Pie Writer	Apple IIe, II Plus, and III	\$150	477
Human Engineered Software (415) 468-4111	HES Writer	Commodore 64	\$40	478
Ideaware (212) 334-8043	Idea Processor	Systems under MS-DOS	\$295	479
IJG (714) 982-7829	Electric Pencil	TRS-80 Models I, III, and 4	\$90	480
Innovative Software (913) 383-1089	The Smart Word Processor	Systems under MS-DOS	\$395	481
Kensington Microware (212) 475-5200	Format II	Apple IIe, II Plus	\$150	482
Leading Edge Products (617) 449-4655	Leading Edge Word Processor	Systems under MS-DOS	\$350 \$495 (with mail-list manager)	483
Lexisoft (916) 758-3630	Spellbinder	Systems under CP/M, CP/M-80, CP/M-86, MS-DOS, or Oasis	\$495	484
Lifetree Software (408) 373-4718	Volkswriter Volkswriter Deluxe	Systems under MS-DOS Same systems	\$195 \$295	485
LJK Enterprises (314) 962-1855	Letter Perfect Simply Perfect	Apple IIe, II Plus Apple IIe	\$105 \$190	486
Marc Software Int'l. (415) 326-1971	Muse Wordmarc	Apollo, HP 9000, Masscomp, Wicat, Sun Microsystems, and Pyramid DEC Pro 350 and Rainbow	\$850 to \$995 \$495	487

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WP Software

(Continued from page 182)

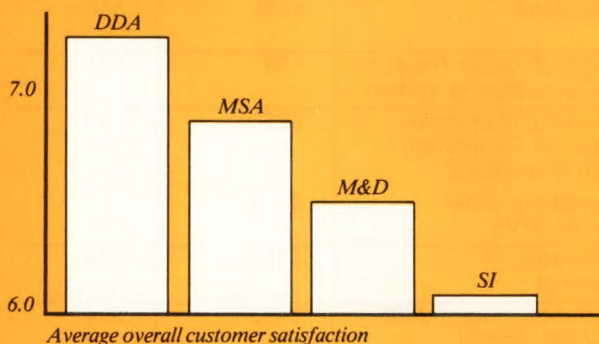
Wp packages for other personal computers

Vendor	Package	Requirements	Price	Circle
Mark of the Unicorn (617) 576-2760	Final Word	Systems under CP/M-86, MS-DOS, Venix, or CP/M-80	\$300	488
	Mince	Systems under CP/M	\$175	
Megahaus (619) 450-1230	Megawriter	Apple IIe, II Plus	\$100	489
Microart (503) 228-1148	Image	DEC Rainbow	\$295	490
Micropro Int'l. (415) 499-1200	Wordstar	Systems under CP/M, CP/M-86, CP/M-80, or MS-DOS	\$495	491
Microsci (714) 241-5600	Insta-writer	Commodore 64	\$52	492
Microsystems Engineering (312) 882-0111	Mass-11	DEC Rainbow	\$995	493
Midwest Software Assoc. (314) 997-6470	Write Away	Apple IIe, II Plus	\$175	494
Miller Microcomputer Svcs. (617) 653-6136	Forthwrite	TRS-80 Models I, III, and 4 with Miller's MMS-Forth operating system	\$175	495
Mirage Concepts (209) 227-8369	Personal Vision	Commodore 64	\$40	496
	Professional Vision	Commodore 64	\$90	
Multimate Int'l. (203) 522-2116	Multimate	Systems under MS-DOS	\$495	497
Muse Software (301) 659-7212	Super-text Professional	Apple IIe, II Plus	\$175	498
	Super-text Home Office	Apple IIe, II Plus	\$175	
Newstar Software (415) 932-2278	Newword	Systems under CP/M or MS-DOS	\$249	499
Palantir Software (713) 520-8221	Palantir	Systems under CP/M, MP/M, MS-DOS, Turbo-DOS, or Mmmost	\$395	500
Peachtree Software (404) 262-2376	Peachtext	Systems under CP/M or MS-DOS	\$250	501
	Peachtext 5000	TI Professional, Zenith Z-100	\$395	
Perfect Software (415) 527-2626	Perfect Writer	Systems under CP/M-80	\$349	502
Pinnacle Software Syst. (303) 224-5061	Superlist Manager	Victor 9000	\$249	503
Prentice-Hall (201) 767-5067	Business Word Processor	Systems under MS-DOS	\$250	504
Professional Software (617) 444-5224	Wordplus-PC	Systems under MS-DOS	\$395	505
	Wordplus-PC with The Boss	Same systems	\$495	
	Wordpro	Commodore 64	\$100	
The Professor (514) 747-9130	Type-writer	Apple IIe, II Plus	\$70	506
Prosoft (213) 764-3131	Newsript	TRS-80 Models I, III, and 4; systems under CP/M	\$18	507

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WP Software

(Continued from page 184)



Wp packages for other personal computers

Vendor	Package	Requirements	Price	Circle
Qax Int'l. Syst. (312) 358-3906	3-16	Systems under Super-DOS Data General Desktop Generation	\$750 \$1,150 \$1,400 (with spelling verifier) \$1,650 (with workstation support)	508
Quark (303) 934-2211	Word Juggler	Apple IIe Apple III	\$189 \$229	509
R Syst. (214) 343-9188	R Word	TI Professional	\$395	510
Racet Computers (714) 997-4950	Electric Pencil	NEC PC8000 under Racet's NEC-DOS operating system	\$99	511
Rational Data Syst. (212) 697-5855	Scred	Data General Micronova and Desktop Generation under DOS or RDOS Same systems under AOS or AOS/VS	\$950 \$1,200	512
Samna (404) 321-5006	Samna Word II	DEC Rainbow, TI Professional	\$450	513
Satellite Software Int'l. (801) 224-8554	Word Perfect	DEC Rainbow, Victor 9000, Tandy 2000, and TI Professional	\$495	514
Saturn Syst. (612) 944-2452	WP Saturn	DEC Pro 350	\$1,400	515
Select Information Syst. (415) 459-4003	Select: The Word Processor	Systems under CP/M, CP/M-86, MS-DOS, or Concurrent CP/M	\$295	516
Sierra Online (209) 683-6858	Screenwriter	Apple IIe, II Plus, and III	\$130	517
Silicon Valley Syst. (415) 593-4344	Word Handler	Apple IIe, II Plus	\$60	518
Sof/Sys (612) 929-7104	Executive Secretary Personal Secretary	Apple IIe, II Plus Same systems	\$250 \$80	519
Software Guild (415) 487-5900	Wordsmith	Apple IIe, II Plus; Commodore 64	\$180	520
Software Publishing (415) 962-8910	PFS: Write	Apple IIe	\$125	521
Sorcim (408) 942-1727	Superwriter	Systems under CP/M, CP/M-86, or MS-DOS	\$295	522
State of the Art (714) 850-0111	State of the Art Word Processing	Apple IIe, III	\$395	523
Structured Syst. Group (415) 547-1567	Word Right	Systems under CP/M, CP/M-80, CP/M-86, or MP/M	\$495	524

Wp packages for other personal computers

Vendor	Package	Requirements	Price	Circle
Syntactics (408) 727-6400	Crystalwriter	Systems under 68000-based multi-user Unix	\$1,000	525
Threshold Software (916) 971-1046	Write/Idea PaperRiter	HP Series 80 HP-86, HP-87	\$225 \$100	526
Timeworks (312) 291-9200	Word Writer	Commodore 64	\$60	527
University Software Assoc. (203) 889-5641	Master Word Processor	HP 9845, 9836, and 9816	\$495	528
Roger Wagner Publishing (619) 562-3670	Write Choice	Apple IIe, II Plus, III	\$45	529
Walker Rees (404) 448-0926	WPS II	Data General Desktop Generation	\$600	530
Westerly Business Syst. (401) 596-1811	WES	Systems under CP/M-80, CP/M-86, MP/M, MS-DOS, or Unix	\$395	531

Spelling verifiers

Vendor	Package	Requirements	Price	Circle
Artsci (213) 985-2922	Magic Word	Apple models with Magic Window I or II	\$70	532
Beaman Porter (914) 967-3504	Powerspell	With Powertext on IBM PC With Powertext on Apple models	\$125 \$100	533
Benchmark Software (602) 961-0003	Benchmark Spelling Checker	With Benchmark Word Processor	\$125	535
Cardco (316) 267-6525	Spell Now	Commodore 64	\$40	536
Emerging Tech. Consultants (303) 447-9495	Spellix	Systems under MS-DOS	\$95	537
Feith Syst. and Software (215) 667-5575	In-context Speller	Systems under Oasis	\$300	538
Hayden Software (617) 937-0200	The Speller	Systems under MS-DOS- based word processors using standard text files	\$50	539
IJG (714) 982-7829	Blue Pencil Red Pencil	IJG's Electric Pencil Blue Pencil	\$90 \$60	540
Image Processing (608) 233-5033	Proofwriter	IBM PC and XT; TI Professional	\$250	541
Legist Automation (817) 274-0089	Reader	Four Phase systems	\$900 to \$2,250	542
Lifeboat Assoc. (212) 860-0300	Microspell	Systems under CP/M, CP/M-80, CP/M-86, MS-DOS, or PC-DOS	\$249	543
LJK Enterprises (314) 962-1855	Spell Perfect	Letter Perfect on Apple micros	\$90	544
Maryland Computer Svcs. (301) 879-3366	Spelling Checker	With Correspondence Processing 250 (on HP 250)	\$450	545

WP Software

(Continued from page 187)

Spelling verifiers

Vendor	Package	Requirements	Price	Circle
Megahaus (619) 450-1230	Megaspell	Apple IIe, II Plus	\$60	546
		IBM PC	\$100	
Micropro Int'l. (415) 499-1200	Spellstar	Wordstar	\$250	547
	Correctstar	Wordstar on IBM PC, Tandy 2000, DEC Rainbow, and TI Professional	\$195	
Oasis Syst. (619) 279-5711	The Word	Systems under CP/M Superbrain (8-inch format)	\$75	548
	Word Plus	Systems under CP/M, CP/M-80, CP/M-86, MP/M, or CDOS	\$150	
Peachtree Software (404) 262-2376	Spelling Proofreader	Systems under CP/M or MS-DOS	\$150	549
Perfect Software (415) 527-2626	Perfect Speller	Perfect Writer	\$129	550
Rio Grande Software (319) 627-2272	Textpro	Systems under CP/M-86 or MS-DOS	\$199	551
Sensible Software (313) 399-8877	Sensible Speller	Apple IIe, II Plus	\$125	552
Sierra Online (209) 683-6858	The Dictionary	Selected word-processing packages on Apple models	\$100	553
Sof/Sys (612) 929-7104	Executive Speller	Executive Secretary	\$75	554
Software Guild (415) 487-5900	Electric Webster	TRS-80 Model III	\$150	555
Software Publishing (415) 962-8910	PFS: Proof	PFS: Write or Wordstar (checks any ASCII file)	\$95	556
Sorcim (408) 946-9000	Spellguard	Systems under CP/M, CP/M-86, MS-DOS, or PC-DOS	\$195	557
Trigram Syst. (412) 682-2192	Microspell V	Systems under CP/M-80 or MS-DOS	\$139	558
Visicorp (408) 946-9000	Visispell	Visiword	\$225	559
Wang Electronic Publishing (617) 967-4541	Random House	Systems under CP/M, CP/M-80, or MS-DOS	\$50	560
Western Software Development (303) 687-2517	Spellpack	UCSD p-System	\$95	561

Supplementary software

Vendor	Package	Requirements	Price	Circle
Benchmark Software (602) 961-0003	Benchmark Mail List (list manager)	Systems under MS-DOS	\$150	562
Cardco (316) 267-6525	Mail Now (list processor)	Commodore 64	\$40	563



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CIRCLE 78

WP Software

(Continued from page 188)

Supplementary software

Vendor	Package	Requirements	Price	Circle
Computer Editype Syst. (212) 222-8148	Magicindex (indexer)	Systems running CP/M-based word-processing packages	\$150	564
	Magicbind (list/text merger)	Same requirements	\$250	
	Magicprint (formatter)	Same requirements	\$195	
The Computer Printout (312) 799-4510	Perfect Mail (electronic mail)	Perfect Composer	\$195	565
Concept Omega (201) 722-7790	Mail Concept (list/text merger)	Word Concept	\$395	566
Digital Mktg. (415) 947-1000	Bibliography (formatter, bibliographer)	Systems under CP/M, CP/M-80, CP/M-86, or MS-DOS	\$99	567
	Documate Plus (indexer)	Wordstar	\$165	
	Footnote (footnoter)	Wordstar or Select: The Word Processor	\$99	
	Incorporated by Reference (stores blocks of text)	Systems under CP/M, CP/M-80, CP/M-86, or MS-DOS	\$125	
	Notebook (stores blocks of text, includes text editor)	Systems under CP/M, CP/M-80, CP/M-86, or MS-DOS	\$150	
	Writer's Pack (spelling/grammar checker, indexer, footnoter)	Wordstar	\$295	
IJG (714) 982-7829	Pencil Ace (adds windows, allows reprogramming of keyboard and editing of many files)	IJG's Electric Pencil	\$149	568
Legist Automation (817) 274-0089	Readability Option (checks readability)	Reader	\$550	569
Megahaus (619) 450-1230	Megafinder (file manager)	Apple IIe, II Plus	\$100	570
Micropro Int'l. (415) 499-1200	Mailmerge (file merger)	Wordstar	\$250	571
	Star Index (indexer)	Wordstar	\$195	
Miracle Computing (913) 843-5863	Kwicindx (indexer)	IBM PC and XT	\$30	572
Muse Software (301) 659-7212	Form Letter (stores text)	Super-text Professional	\$100	573
	Address Book (list manager)	Super-text Professional or Form Letter	\$50	
Oasis Syst. (619) 279-5711	Punctuation & Style	Systems under CP/M (8-inch format), MP/M, CDOS; IBM PC	\$125	574
Peachtree Software (404) 262-2376	List Manager	Systems under CP/M or MS-DOS	\$250	575
Satellite Software Int'l. (801) 224-8554	ISAM (file merger)	Data General personal computers with Word Perfect	\$200	576

(Continued on page 191)

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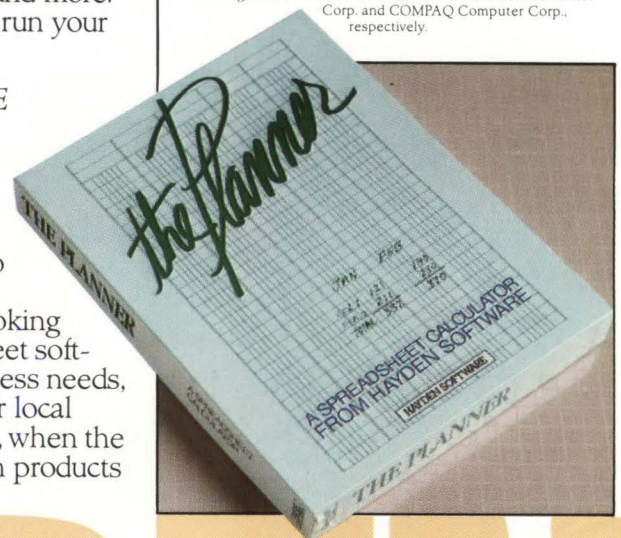
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Form letter merge	✓ (opt)	✓	✓
Move text between documents	✓		✓
Table insertion	✓	✓	✓
Cut and paste	✓	✓	✓
Header/footer	✓	✓	✓
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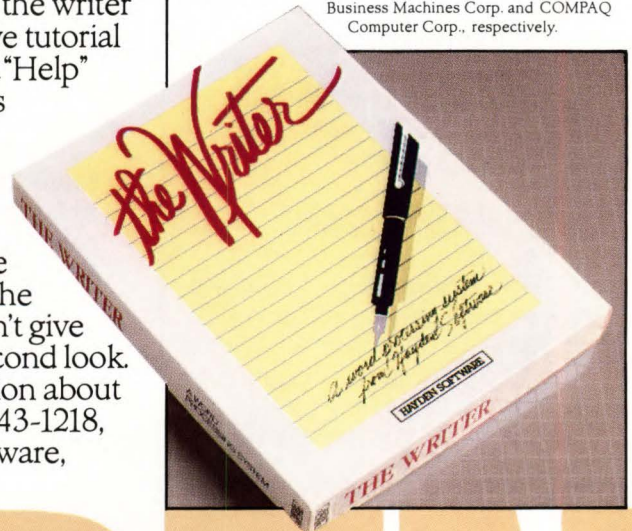
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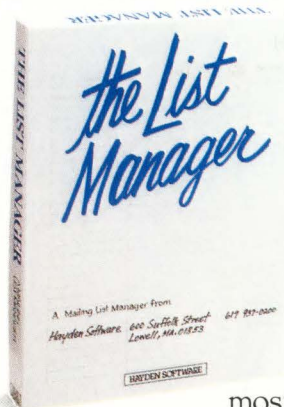
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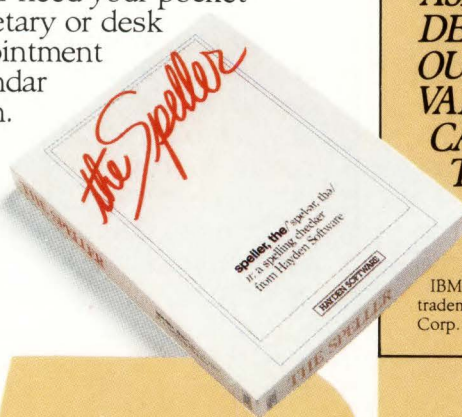
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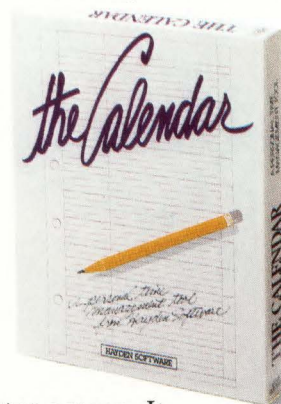
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HAYDEN

WP Software

(Continued from page 190)

Supplementary software

Vendor	Package	Requirements	Price	Circle
Sensible Software (313) 399-8877	Bookends (bibliographer and footnoter)	Apple IIe, II Plus, and III	\$125	577
Sof/Sys (612) 929-7104	Executive Footnoter (also indexes)	Systems under Apple-DOS	\$75	578
Wang Electronic Publishing (617) 967-4541	Grammatik (grammar checker)	Systems under CP/M, CP/M- 80, or MS-DOS	\$75	579

Wp packages for small IBM cpus

Vendor	Package	Requirements	Price	Circle
Academic Software (213) 544-2852	Subscript	Series/1	\$1,725	580
Accusoft (415) 459-7540	Zword/34 Zword/36 Zword/38	System/34 System/36 System/38	\$3,000	581
Alro Computer Software (517) 787-2204	Easyword/38	System/38	\$499	582
Business Computer Pros (314) 726-9703	BCP Word Processor	System/34, S/38	\$300	583
Delphi Data Syst. (612) 941-9182	Multiword	Series/1	\$1,995	584
Financial Software (404) 491-3300	WP/34 WP/36 WP/38	System/34 System/36 System/38	\$1,895 (\$2,495 if used with laser printer) \$1,895 (\$2,495 if used with laser printer) \$4,500 (\$5,000 if used with laser printer)	585
Granada Syst. Design (212) 686-6945	Wordbench	Series/1	\$900	586
Hamlin, Williams & Assoc. (901) 388-6120	HWA Word Processor	5110, 5120	\$450	587
Mgt. Kinetics Int'l. (312) 397-0060	Word/Manager	Series/1	\$2,150	588
Oak Software (813) 441-1219	Word Processing System	System/34, S/36 System/38	\$2,500 \$3,500	589
Option/1 Syst. (818) 999-6250	Word/3	5110/5120	\$1,000	590
Para Research (617) 283-3438	Easytext	System/34, S/36 System/38	\$750 \$1,500	591
Professional Computer Resources (312) 932-2200	Wordpower II	System/34	\$1,500	592
Systar (408) 280-7066	WP/1	Series/1	\$1,400 (\$1,900 spelling checker)	593

WP Software

(Continued from page 191)

Wp packages for other minicomputers

Vendor	Package	Requirements	Price	Circle
Afcad Syst. (201) 469-6000	Afcad	Prime systems	\$13,000	594
Applied Tech. Ventures (216) 589-0525	Uniword	Systems under Unix	\$495 to \$1,995	595
ATS Data Processing (904) 433-7578	Digitext	DEC VAX and PDP-11	\$3,500 (single user) \$7,500 (multi- user)	596
BEI (206) 282-2014	Autodoc	Wang VS	\$6,000	597
BOS National (214) 484-2717	Autowriter	Systems under BOS and MBOS transportable operating systems	\$550 (single user) \$900 (multi- user)	598
Bristol Information Syst. (617) 679-1051	DIS Letter Writing System	Datapoint systems	\$900	599
Brown Assoc. (717) 392-1700	Brown Word Processing	NCR systems	\$2,100	600
California Syst. Assoc. (714) 546-9716	PowerWP	DEC PDP-11 and VAX	\$2,395 to \$4,700	601
The Computer Printout (312) 799-4510	Perfect Composer	Wang 2200	\$495	602
Compu-Tome (213) 796-9371	CTOS	DEC PDP-11 and VAX	\$2,200 to \$6,500	603
Computron Software (201) 865-8400	Lister	Wang VS	\$5,000	604
	Lister 2000	Same system	\$10,000 to \$15,000	
	Boiler	Same system	\$5,000	
	Consumer Correspondence	Same system	\$65,000 and up	
Cyex Syst. (312) 298-2588	Cy-Global	TI Series 300 and up	\$1,250 to \$4,000	605
Data Processing Design (714) 993-4160	Word-11	DEC PDP-11	\$3,500 to \$8,500	606
		DEC VAX	\$8,500 to \$9,500	
Delphi Data Syst. (612) 941-9182	Multiword	HP 3000	\$2,500	607
EEC Syst. (617) 358-7781	Lex-11	DEC PDP-11 and VAX under VMS	\$4,000 to \$7,500	608
		Same systems under Unix, Idris, IAS, RSTS/E, or RSX-11M	\$4,000	
		Same systems under TSX-Plus	\$1,750	
		Same systems under RT-11	\$995	
Exact Syst. and Programming (914) 273-8100	Word-base	Data General Nova with DNA-4	\$2,500	609
		Data General Eclipse with DNA-4	\$4,500	
Horizon Software Syst. (415) 751-1311	Horizon Word Processing	Systems under Unix-based operating systems	\$595	610

Wp packages for other minicomputers

Vendor	Package	Requirements	Price	Circle
IPT (415) 326-1971	Tips	Data General DEC VAX and PDP-11 running RSTS/E and RSX-11M	\$695 to \$6,000 Same price range	611
Marc Software Int'l. (415) 326-1971	Muse	DEC VAX; Prime; Harris	\$4,500 to \$12,500	612
Maryland Computer Svcs. (301) 879-3366	Correspondence Processing 250	HP 250	\$2,500	613
MBA Syst. Automation (614) 231-2130	Xword	DEC PDP-11 under RSTS	\$3,000	614
Microsystems Engineering (312) 882-0111	Mass-11	DEC VAX under VMS	\$11,500	615
Plessey Peripheral Syst. (714) 540-9945	Plessey-WP	DEC LSI-11, PDP-11, and VAX	\$700 to \$3,920	616
Point 4 Data (714) 863-1111	Stylus Typist	Data General Nova with Iris Same system	\$2,000 \$2,000	617
Qax Int'l. Syst. (312) 358-3906	3-16	Data General supporting Business Basic	\$1,150 \$1,400 (with spelling verifier) \$1,650 (with workstation support)	618
R Syst. (214) 343-9188	R Word	TI 990 Any 68000-based machine under Unix	\$2,195 \$895	619
Rational Data Syst. (212) 697-5855	Scred	Data General under DOS and RDOS Same systems under AOS/VS	\$950 \$1,200	620
Satellite Software Int'l. (801) 224-8554	Word Pe'fect	Data General	\$200 to \$5,000	621
Saturn Syst. (612) 944-2452	WP Saturn	DEC PDP-11 and VAX under RT-11 Same systems under TSX+, RSX, RSTS, or VMS	\$1,400 \$2,500	622
Software Consulting (215) 861-7920	DOC-F	Cobol-based systems	\$1,000	623
Taft Consulting (212) 425-8070	Compos/Mentis	Tandem computers	\$35,000	624
T.F. Hudgins & Assoc. (713) 682-3651	Ccredit	DEC under RSTS/E	\$210 (tape) \$250 (disk pack)	625
Timberline Syst. (503) 684-3660	R Systems Word Processing Type II	TI Series 300 and up Same systems	\$3,000 \$2,000	626
TOM Software (206) 246-7022	Data 3500	Wang 2200	\$750 to \$2,900	627
Trident Data Syst. (213) 645-6483	Lastword	HP 3000	\$2,500	628
Vista Computer (914) 592-8190	Viewpoint	Data General under AOS, AOS/VS, or VSM	\$5,000	629
Walker Rees (404) 448-0926	WPS II	Data General supporting Basic or Basic II	\$1,800	631

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by Mary Miles, New England Editor

YOUR CAREER

So you didn't get that promotion . . .

A couple of months ago, Lucy Goode, your boss, told you she was moving on to greener pastures. This development excited you: As her protege, you'd be next in line to succeed Goode.

But today, after weeks of anxiety and pressure, you've been introduced to Goode's successor. Your mouth is dry, your chest is tight, and your hands tremble as you greet your new boss. After the introduction, you're left to ponder what went wrong. Goode groomed you, helped you hone your management skills—how could the powers that be have passed you over? Moreover, how can you carry on?

You might decide to update your resume and search for a new job. But if you decide to stay on, you should resolve not to hurt any future chances of promotion. Try to quell three instinctive reactions:

- Don't whine or complain. If you burst into the executive suite crying that the company *owed* you the promotion, you risk creating the impression that you're immature and lack self-control.
- Don't sulk. Sure, you're disappointed, but withdrawing into a depressed silence will prevent you from learning why you were passed over and possibly stifle your professional growth.
- Don't threaten to quit unless you mean it. Superiors usually respond to such intimidation by showing you the nearest exit.

You've suffered a setback and you've got to adjust. Losing the promotion needn't be an insurmountable roadblock to your career. If you act in a positive, judicious way, the experience might propel you to a higher career perch than the one you just missed.

Missing a promotion is particularly painful when you lose to an outsider. If a colleague whose qualifications you know are superior to yours got the job, you'd be able to carry on without too much trouble. The appointment of an outsider, however, makes you wonder if you're invisible to the brass. Have you touted your accomplishments loudly enough? Should you have spent more time rubbing elbows with influential executives?

According to George Rossi, president of the Burlington, MA, office of Gilbert Tweed Associates, a New York-based executive-search firm, even if you make yourself known to the brass, you might come up short in the race for a higher position. When a corporation enlists the aid of a headhunter to fill a top position, it usually means it has already looked at its internal talent pool, he says. "Companies today are raising the bar higher every year," he explains. "In a tough, competitive marketplace, they have to strive to find the best-qualified executives for key positions." If there's a chance of attracting a proven performer from outside the organization, top management will pass over promising managers on the inside.

Twenty years ago, says Rossi, it was easier to get into the fast track and remain there. "The employee who dressed the part, said the right things, and let management know he or she was willing to go anywhere and do anything was a sure bet to move right along," he says. "But today, companies are looking for high-quality work and a track record. They want 'integrators'—executives who have produced results with teams of employees."

What should you do to get back on the upward track after being passed over? The old maxim, "Know thyself" and a corollary, "Know thine organization" should be your guidelines. First, try to stop hurting. Then, rationally assess your situation. Your employer's move was a professional judgment, not a personal rejection. Why did you want the promotion in the first place? Are you after an increase in salary? Prestige? Responsibility? A new challenge? Answering these questions will help you focus on your career goals.

As you search your soul, don't be afraid to admit that maybe the reason you were passed over was that you were afraid of promotion. Many young professionals, in particular, fear that their management skills are still underdeveloped and will make them vulnerable in a new position. (An article on the trauma of promotion will appear in next month's issue.)

Rossi believes personal skills are vital to a fast-track career. Even if you have the technical or operating skills for the job, you'll miss out if you haven't demonstrated an ability to negotiate or build a collection of pros into a cohesive staff. You may also need a better understanding of how your department fits into the organization's overall processes and goals.

Getting reoriented

One of the most important steps in your self-assessment is examining your function within the organization. What is your contribution to the growth and performance of the corporation? Do you fit in—or should you make adjustments? If you're doing your best and still not making it,

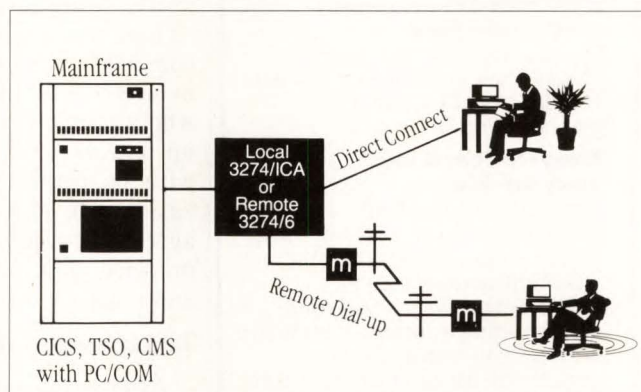
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YOUR CAREER

maybe you should take your talents elsewhere.

If you conclude that you ought to leave, one option may be outplacement by your employer. "Outplacement is usually reserved for executives who are being terminated," says Rossi. "But not always. When employees find themselves out of sync with the organization—for whatever reason—the corporation may decide to help them find new positions with other organizations."

According to John D. Erdlen, president of Costello & Erdlen, a Wellesley, MA, personnel consultancy, outplacement is an option for more and more managers and executives. "There's a newly developing social consciousness in some corporations," he says. For example, a vice president who was reassigned during a shake-up felt his new assignment left him with no future within the organization. He and the company disagreed about his decision, but he was provided with outplacement services and a good severance agreement.

Taking positive action

After you've assessed your position, make your ambitions known to your superiors. Regular meetings with your new boss to discuss your goals and progress toward them can help you regain the momentum you had before you were passed over. During these sessions, press your boss to outline the goals the organization has for you, and point out those that you have already accomplished.

Progress sessions with the boss remove the mystery from your future chances of advancing to a higher perch. You'll also enlist your boss as an ally—which never hurts. If you believe training and special coursework, closer contact with other departments, or assignments to specific projects will help you move up, your boss will probably help you get what you need.

If, after all your contemplation, you conclude that you were the best candidate to succeed your boss, find out why you were passed over. Find

out if you were considered for the job and why you were rejected. What will you need to get the next appropriate promotion? Open, candid communication with superiors is vital, says Rossi. It gives you a better understanding of where you fit in and what you need to get back on the right track.

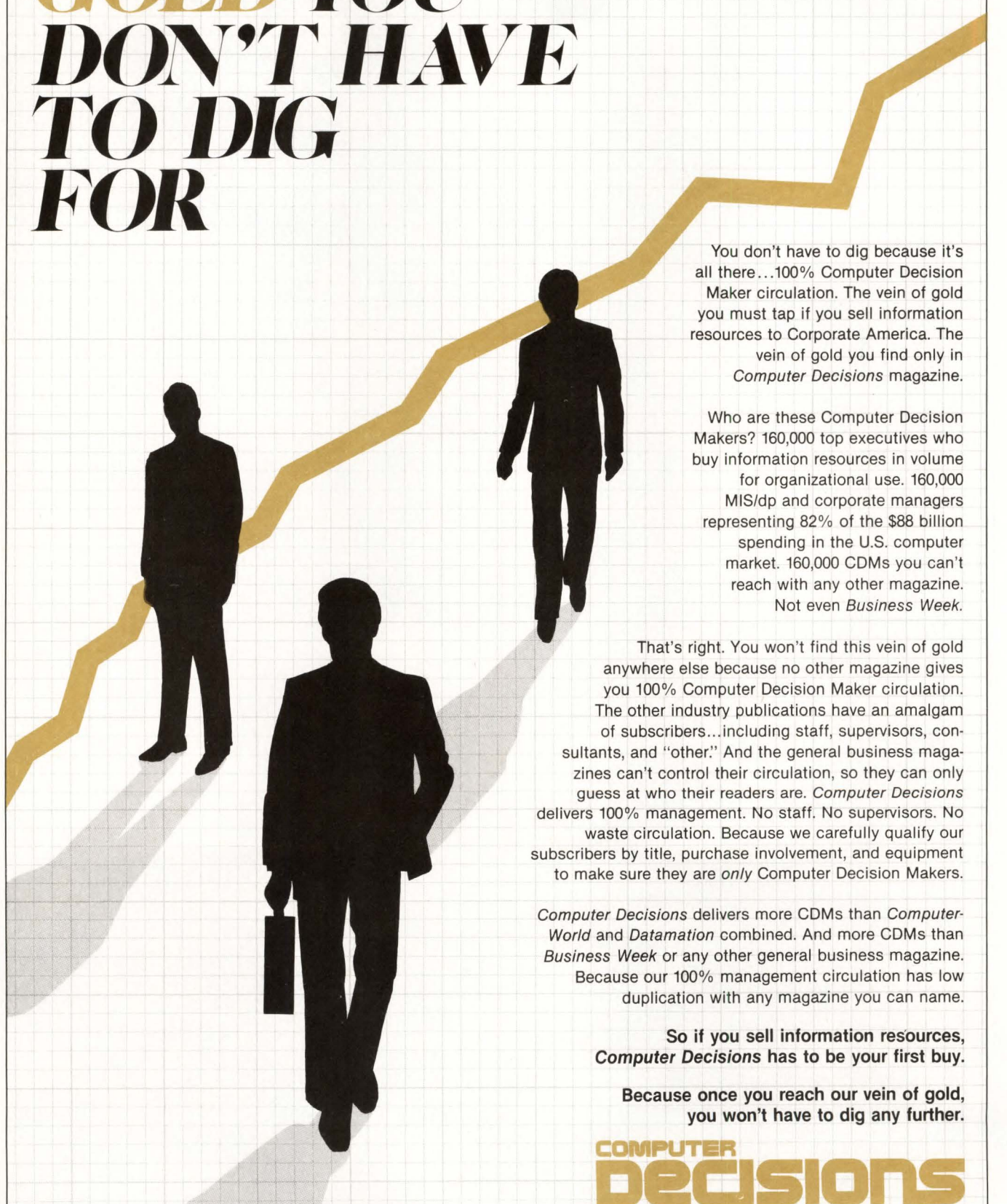
Better communications

Pushing for better communication with top management is particularly important in corporations with vague promotion policies, standards, and goals. If the company doesn't provide the impetus for discussion of your goals and how they fit into the organization's game plan, you may have to. Rossi's firm encourages its clients to deal openly with internal applicants. "It's important for a person who's been passed over to know that the decision-makers aren't writing him or her off," he says. "They want all employees to be successful and get ahead, but putting someone in a big job before he or she is ready isn't wise."

Don't be surprised if you're asked to help Lucy Goode's replacement get acclimated to the job and the organization. It will be difficult at first, but you can turn this unpleasant assignment into a beneficial experience. For one thing, you'll be able to observe what the new boss has that you don't. Secondly, you may be able to enlist his or her help. "Becoming the right-hand person to the person who got the job you wanted can be a fantastic learning experience," says Rossi.

If you believe that undue modesty has hurt your bid for promotion, you might start tooting your horn. There's nothing wrong with letting others know about the great job you're doing. But there are subtleties to observe. Don't be dissonant or overbearing. If you want to attain the rank of maestro, you not only have to show your superiors that you're a first-class soloist, you must also prove you can harmonize with co-workers. □

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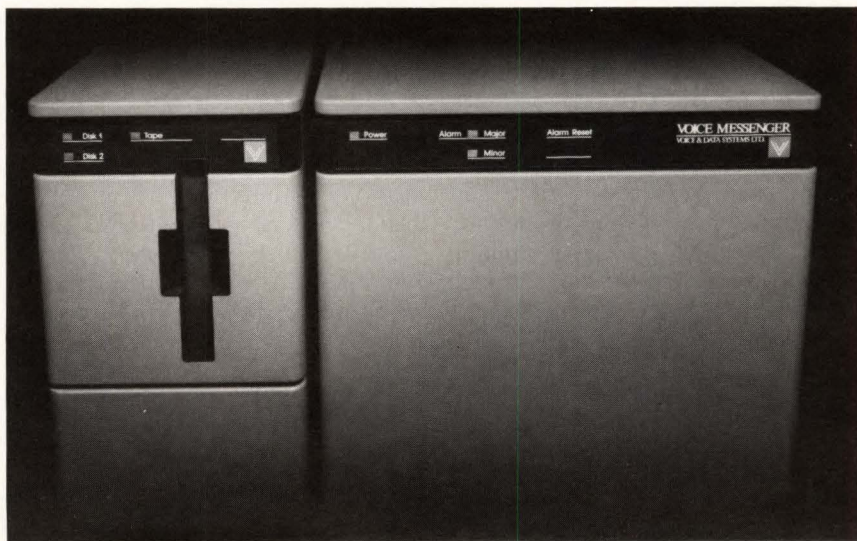


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SHOW PREVIEW

Syntopican XII

Communications—the sharing of information is one of the key issues in office automation today. It is also the focus of this year's Syntopican XII conference.

The conference is scheduled for July 18 through July 21 at McCormick Place in Chicago. Thousands of information-system professionals are expected to participate in more than 60 lectures, workshops, and panel discussions. Sessions will include: systems design for communications, alternate communications approaches, communications standards, telecommunications, and interpersonal communications.

More than 100 exhibitors will display the latest networking and communications equipment, peripherals, supplies, and accessories. The exposition will also feature AISPNNet-2, a working laboratory of office communications that will demonstrate the interconnection of dissimilar office devices, and show how to provide advanced office-automation services through local-area networks (LANs).

The keynote address, "Brave new work: technology and tomorrow's jobs" will be delivered by Marvin J. Cetron, president of Forecasting International Ltd. and author of *Jobs for the future: 500 jobs, where they'll be and how to get them*.

Two vendors—Digital Equipment Corporation (DEC) and Tandy Corp. (maker of the Radio Shack line)—



Photo by Ewing Galloway

will run hands-on sessions featuring personal computers. Attendees will become acquainted with the power and utility of personal computers as tools for office-information systems. The workshops are open to the novice and the experienced user.

A special session, led by Patrick Portway of Satellite Communication Services from an Alaskan government office, will offer attendees a live video transmission to demonstrate the advantages of satellite communications. A question-and-answer session between attendees in Chicago and Portway will follow.

Other scheduled sessions include:

- Strategies for developing office information systems: Gerald L. Hershey, University of North Carolina.
- LANs: the backbone of OA. Brian Blackmarr, Lifson, Herrmann, Blackmarr & Harris.

- Integrating multi-vendor environments: Michael Zisman, president, Integrated Technologies.

- Decision-support systems and information resource planning: Jody Martin, Helix Corp.

- Meeting electronically—surveying the state of the art: Thomas Cross, Cross Information Co.

- Integrating voice and data—the next generation in business communications: William Koravatos, Ztel.

- The personal computer in context: where, when and why should organizations use their personal computers? Randy Gold-

field, President, The Omni Group.

- The payoff in OA and personal computing: Henry Anacona, DEC.

- Strategic planning: developing the interactive office: Marty Gruhn, The Sierra Group.

- Training strategies for the interactive office: a workshop: Randy Goldfield, The Omni Group.

- Organizational OA: systems design for multiple users: Don Bentley, Duffy and Bentley Consulting Group.

- A special session for executives: The executive's role in managing change: Vernell Munson, Wang Laboratories.

The registration fee for the conference and exposition is \$350. For more information contact The Association of Information Systems Professionals, the sponsoring organization, by calling (215) 657-6300. □

SHOW PREVIEW

Siggraph

Business professionals, end users, computer-graphics experts, free-lance artists, or anyone interested in computer graphics should attend Siggraph '84. The 11th annual conference and exhibition on computer graphics and interactive techniques will be held July 23-27 in Minneapolis. More than 200 exhibitors will display the latest advances in computer-graphics hardware, software, peripherals and services in the 75,000-square-foot Minneapolis Auditorium and Convention Hall.

Siggraph '84 participants can attend a variety of educational sessions led by computer-graphics professionals. Up to 30 one-to-two day courses will be offered on such subjects as technologies of interactive video, bit-map graphics, the mathematics of computer graphics, and advanced topics in curves and surfaces. Course offerings are divided into four categories: general topics, graphics applications, computer-aided design, manufacturing, and engineering (CAD/CAM/CAE), and animation/image synthesis.

Among the offerings are the following:

- Introduction to computer graphics: Marcell Wein, National Research Council of Canada.
- Office automation with a graphic accent: Amy D. Wohl, Advanced Office Concepts.
- How to design user-computer

interfaces: James Foley, George Washington University.

- Distributed graphic systems—workstations, microcomputers, and mainframes: Robert M. Dunn, R.M. Dunn & Associates.

- Microcomputer graphics: Howard Pearlmuter, Softweaver. In addition to examining the latest hardware offerings, this panel will discuss the ramifications of mass-market software on the future of computer graphics.

- Role and reality in graphics standards: James R. Warner, Precision Visuals.

- State-of-the-art vs. use-of-the-art: Carl Rosendahl, Pacific Data Images. Discussions will focus on how well and to what degree state-of-the-art computer-graphic techniques are being used.

- The storage and retrieval of inte-

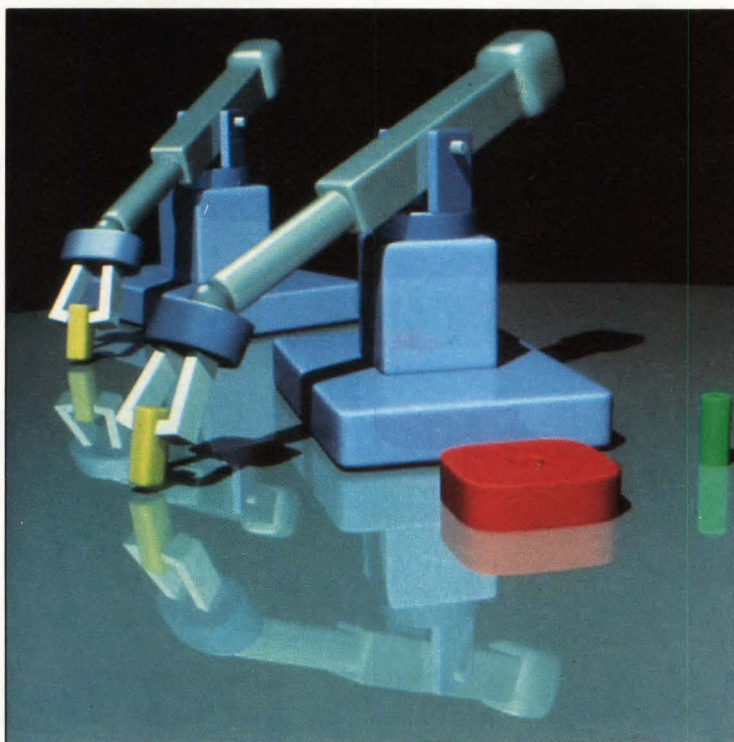


Photo by Raster Technologies

grated graphics and text: R.A. Earnshaw, University of Leeds.

- Computing in the fast lane: super systems for computer graphics: Richard Weinberg, Fifth Generation Graphics.

- Applying computer graphics in science and engineering: David J. Kasik, Boeing Computer Services.

- Introduction to raster graphics: Donald Greenberg, Cornell University.

- A retrospective: six perennial issues in computer graphics: Robert Dunn, R.M. Dunn & Associates.

Siggraph '84 offers several special attractions including the

first totally computer-generated Omnimax film, allowing participants to view recent works of well-known artists on a dome-shaped screen. A design-arts show will dramatize the constantly developing applications of computer graphics with emphasis on architectural, industrial, and visual communication design. The show will be held at The Minneapolis College of Art and Design, 133 East 25th Street. An evening of film and video shows will present the latest scientific and artistic examples of computer graphics and industry.

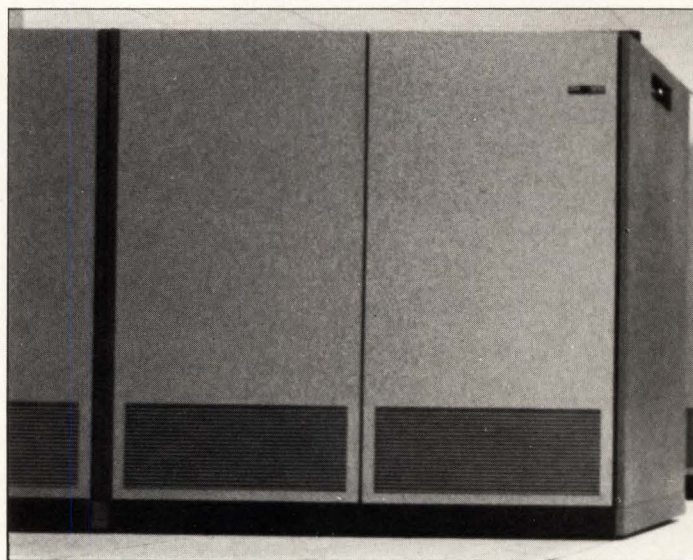
The registration fee for technical programs is \$365. For two-day courses the fee is \$410, and for one-day courses it is \$280. Siggraph offers substantial discounts to early registrants. For further information contact the Siggraph '84 conference office at (312) 644-6610. □

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Photo courtesy of McDonnell Douglas Corp.

NCC PRODUCTS PREVIEW

Supermicro OS

The DES/RT operating system for 16- and 32-bit microcomputers allows multi-tasking on multiprocessor machines, and has networking capabilities. It features a high-performance message-based kernel with virtual-memory management, a 4-Gbyte distributed-file system, and a hierarchical directory with database capabilities. It can be linked to many different micros. Price is \$450 plus connection costs.

The Destek Group, 830 E. Evelyn Ave., Sunnyvale, CA 94086. (408) 737-7211.

Booth C3436

Circle 380

Intelligent workstation

Microdata 1000 modular intelligent workstations have a full range of office-automation features, can tap into corporate databases, and perform 10 different applications at once. The relational database-management system is integrated



with the office-automation features. Prices start at \$8,075 for a single-station system with software.

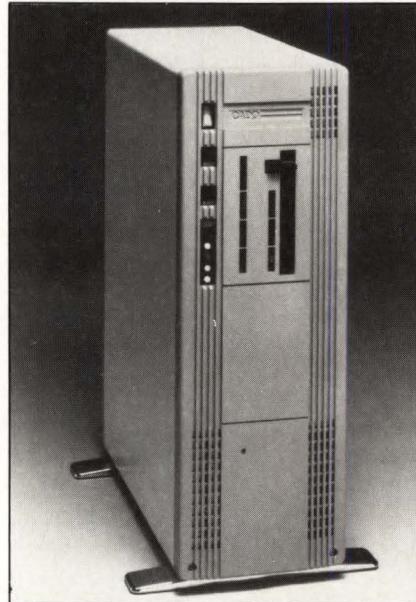
Microdata Corp., 17481 Red Hill Ave., Irvine, CA 92714. (714) 250-1000.

Booth C3566

Circle 381

Modular system

The Tiger ATS 16 multi-tasking system supports up to 16 terminals, printers, peripherals, or communications devices. A basic system, with 512-Kbytes of random-access memo-



ry (RAM), 10 Mbytes of Winchester storage, and 1.2 Mbytes of diskette storage, is \$12,895.

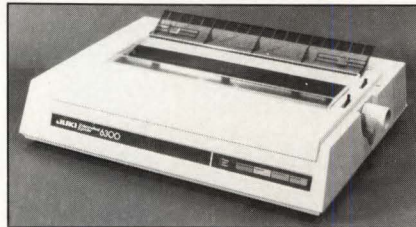
Cado Systems Corp., 2055 W. 190th St., P.O. Box 3759, Torrance, CA 90510. (213) 323-8170.

Booth C3856

Circle 382

Daisywheel printer

Juki Model 6300 printer has a Diablo 96-character daisywheel and a 3-Kbyte buffer memory expandable to 15 Kbytes. It has a 16-inch-wide platen and offers a printing speed of



up to 40 characters per second. Price is \$1,000 to \$1,200. The noise level is less than 60 decibels.

Juki, 299 Market St., Saddle Brook, NY 07662. (201) 368-3666.

Booth A2644-2646

Circle 383

Furniture line

The 5700 Series of computer furniture consists of two stands that accommodate any personal computer or printer. Price: \$59 each. They have 24-by-20-inch plastic tops, black textured 27-inch-high frames, and



modesty panels. One model contains a slot 15 $\frac{3}{4}$ -by-6-inches in dimension. Royal Seating Corp., P.O. Box 753, Cameron, TX 76520. (817) 697-6421.

Booth D4321

Circle 384

Accessories

An adjustable Anti-Static Wrist Support (see photo) attaches to computer tables and holds the user's wrists to reduce strain and protect against static. Price: \$59. A desktop Diskette Library File holds 10 diskettes and has a pop-up easel that folds back. Price: \$8 for 5 $\frac{1}{4}$ -inch and \$12 for 8-inch. A Diskette Tray, holding sixty 5 $\frac{1}{4}$ -inch diskettes, has dividers, color-coded labels, and a master index card. Price: \$27. Three 5 $\frac{1}{4}$ -inch diskettes and one inch of paper documentation can be stored together in a vinyl Software Binder. Price is \$20 for 11-by-8 $\frac{1}{2}$ -inches, and \$15 for 9-by-6-inches. An Anti-Static Mat dissipates static. It can be put on a desktop or under equipment and comes in three sizes, at \$13, \$40, and \$70.

Acco International Inc., 770 S. Acco Plaza, Wheeling, IL 60090. (312) 541-9500.

Booth B4238

Circle 385

Relational DBMS

The DM database-management system, so far available for DEC VAX minicomputers, handles variable-length text and numeric data and offers flexibility for a wide range of business applications. Prices start at \$29,000 for the minicomputer version. The system is modular, with a central processing kernel, handling up to 511 simultaneously executing programs that manipulate up to 125 databases. Each kernel supports up to 2,000 databases and 65,000 users. It includes a sophisticated report writer, Cobol and Fortran pre-compilers, and system-maintenance utilities.

Battelle, 505 King Ave., Columbus, OH 43201. (614) 424-6424.

Booth C4336
Circle 386

Supermini IBM emulator

The Canaan Multi-user Personal Mainframe 5800 Series is a line of 32-bit super-minicomputers that run IBM 370 software under VM/CMS through a distributed-processing system. Each system supports eight users. Ports can be configured for asynchronous, bisynchronous, or SDLC operation. It has 2 Mbytes of memory and an 85-Mbyte Winchester disk drive. Other features include full graphics, multi-window display for multiprocessing, and memory management. Prices begin at \$24,900.

Canaan Computer Corp., 39 Lindeman Dr., Trumbull, CT 06611. (203) 372-8100.

Booth C4382
Circle 387

COM tape drive

A dual-density streaming magnetic-tape drive for Kodak Komstar micro-image processors operates at either 6,250 or 1,600 bits per inch. Price: \$40,000 to \$48,000. The Komstar

laser-driven computer-output microfilm device generates printouts and reports on either 16mm microfilm or 105mm microfiche at the rate of



10,000 pages per hour. The tape drive allows users to process long jobs off-line and short reports online. It's also compatible with Kodak KOM-80 and KOM-90 devices.

Eastman Kodak Co., 343 State St., Rochester, NY 14650. (716) 724-4664.

Booth A1142
Circle 388

Matrix printers

The Genicom 4000 shuttle matrix-line printers offer three modes: draft, near-letter quality, and graphics/plotting. They're designed for high-throughput, heavy-duty cycle printing. Model 4410, which prints 300 lines per minutes, is \$5,500. Model 4440 (see photo), printing 600 lines per minutes, costs \$7,200. Two serial impact-dot matrix printers are also being shown. They offer five print modes, four character styles, and five character pitches. Model 3014, with speeds from 32 to 160 characters per second, is \$1,195. Model 3024 has speeds from 40 to 200 characters per second and costs \$1,495.

Genicom Corp., One General Electric Dr., Waynesboro, VA 22980. (703) 949-1000.

Booth C3308
Circle 389

Compatible terminal

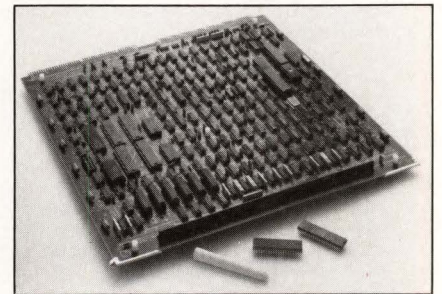
The Model 7-HNY multi-function terminal is compatible with the Honeywell VIP7300 series and DEC VT102. It features 12 pre-programmed function keys, 512-character nonvolatile memory, two bidirectional RS-232C ports, expanded-line drawing and mosaic-character sets, and several display attributes. The 12-inch size is \$1,695; it also comes in 9-inch and 15-inch sizes.

Teleray, P.O. Box 24064, Minneapolis, MN 554245. (612) 941-3300.

Booth A1858
Circle 390

Three controllers

Model ZDF-1 Slot Saver (see photo) controls disk and tape drives from a single board on Data General's



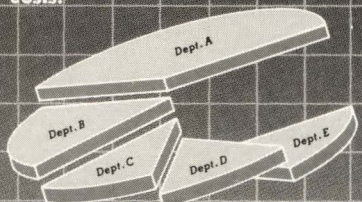
Nova/Eclipse Series minis. Drives can be operated from a console. Price: \$4,195. Model BMX-2 magnetic-tape coupler is plug-and-go compatible with the MV/Eclipse Series minis and supports 4307 and 6026 emulations under AOS/VS. Price: \$1,995. The BMX-1 single-board disk-drive controller supports four SMD disk drives on Data General's Burst Multiplexor Channel. Price: \$4,995.

Custom Systems Inc., Zetaco Div., 6850 Shady Oak Rd., Eden Prairie, MN 55344. (612) 941-9480.

Booth B4030
Circle 391

Total DP Expenses

When data processing costs are treated as a single overhead expense, DP management is squeezed between growing user demand... and pressure from above to control or cut costs.



KOMAND allocates the true costs of any job or job step to user budgets. Informed decisions can be made about cost vs. worth of DP use, and hardware needs can be justified.

OS/MVS USERS: How to distribute DP expenses equitably to user budgets.

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Datapro has this to say about KOMAND: "All (interviewed) users unanimously agreed that the installation of KOMAND resulted in a dollar savings for their institutions." You should consider KOMAND for your OS/MVS environment. It's a modular system that allows you to choose only the components you need for now, adding others as your requirements grow. Call today for information and a free job accounting evaluator.

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CIRCLE 89

LETTERS

Important volts

Your article in the March issue on power protection for large computers was good, but I take issue with the power-equipment vendors who stated that volts don't count. That is untrue! Volts do count.

Prospective clients who want to know whether or not a particular feature is important should ask a hardware field-service engineer rather than a power-conditioning vendor.

It is true that some kinds of power-conditioning equipment can be incompatible with certain mainframes and peripherals. But that will not change the computer's power requirements. Conditioning-equipment vendors should not specify computer-power requirements. That is the responsibility of mainframe manufacturers.

Ed Muxo

President

Computer Power Solutions
Placentia, CA

Mistaken identity

In the February "New products" section you announced that Point 4 Data Corporation has a new Products and Services Catalog. While this is correct, you mistakenly printed that the Lotus Cache Memory had been reduced in price by 25 percent to \$3,200. The confusion probably stemmed from the fact that the Lotus 710 Disk Controller was the item that had been reduced to \$3,200—a 14 percent reduction.

I hope that this explanation will clear up any confusion among your readers regarding the cost of the Lotus Cache Memory.

Jim Campbell

Point 4 Data Corporation
Irvine, CA

C'mon, standards

Regarding your April editorial, "C'Mon, teletext": Why wish for teletext or interactive videotex to help get an old runaway horse back in the barn? C'mon, standardization.

Even American Airlines is getting into the telemarketing-service business. Do you suppose it knows something—like where business-travel dollars are flying in the future?

Go ahead, use the new data-communication technologies to keep up to the minute on chaotic airline schedules or to look for halfway reasonable fares.

But let's also work toward rapid implementation of a graphic business data-communications system that is truly useful as a universal communications medium.

D.D. Arrasmith

MTI

Marion, IA

The AWEF-JIO: typing system

Regarding your recent article dealing with the Qwerty and Dvorak keyboard systems ["Building up your personal computers, part II," March], I believe any discussion on this subject should come to a screeching halt the first time the phrase "home keys" is mentioned.

If you place your hands, palms down, on a flat surface, it is apparent that the two center fingers extend further than the first and little fingers. If you curl the fingers into a typing posture, the same is true. If this position is held, and the fingers are placed on a Qwerty keyboard, the home keys become AWEF and JIO:. With this placement, the hand is in a natural, more comfortable position.

You now have four vowels, AEIO, under your fingers. Nearly every word in the English language has at least one vowel. This modified finger positioning accomplishes the same result as the Dvorak system with its unnatural hand position for the home keys—except that now the I, rather than the U, is under direct finger control. Letter-frequency tables show that the I is used more often than the U.

A person trained on a standard keyboard is going to have difficulty, and incur a considerable expense, while learning the Dvorak system.

Let's teach our students how to type more efficiently with the AWEF-JIO: system. Letter-frequency tables rapidly point out deficiencies in the standard keyboard, but until we can get our educators to teach a more useful system, like AWEF-JIO:, I suggest leaving the keyboard alone and getting back to the fundamentals of learning how to type properly.

James E. Dolan

Vice President of Engineering
Galaxy Engineering Co.

Gary, IN

Address letters to the editor to
Computer Decisions, 10 Mulholland
Dr., Hasbrouck Heights, NJ 07604.



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FOR LITERATURE CIRCLE 99

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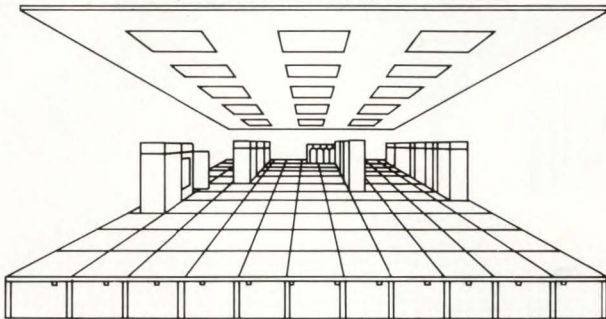
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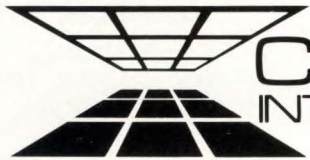
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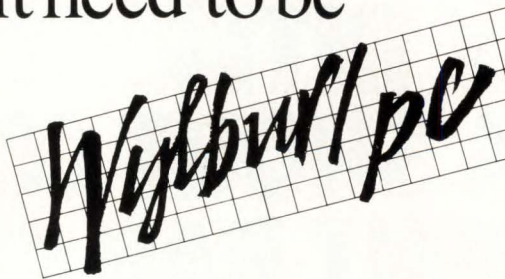
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CIRCLE 151

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Wylbur/pc is a program development environment that simplifies the process of writing and running stand-alone and micro-mainframe applications for the IBM PC. For example, it's perfect for writing "front-ends" to simplify and standardize the use of other software packages.

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CIRCLE 152

Info Centers

(Continued from page 113)

elements for their databases. With Express, they'd developed the systems themselves.

Feinleib: We're likely to see a new kind of backlog in the future, though, a *service* backlog. Data processing just won't be able to keep up with the flow of technology, the different tools, and all the user experimentation. We have far more users walking

"Should we care whether user A is using the same hardware, software, or protocols as user X?"

Stutz, General Foods

into computer stores just to try out packages than we have data-processing professionals to do in-depth software analyses.

Information centers have changed life for traditional data-processing departments. In some cases, the relationship between the information center and dp staff has been strained.

Stutz: Some programmers and analysts are reluctant to alter the way they work. They ferociously clutch their old methods. It's dismaying that these merchants of change are so resistant to change.

Webber: I've heard stories of MIS professionals' actually sabotaging information centers, criticizing them to their users, and so on.

Johnson: My experience has been just the opposite. Our programmers are pleased that the information center is siphoning off some of the systems-development pressure. In fact, programmers have come to the center for the same kind of tools we offer end users—word processing, project management, and the like.

Giannantonio: If your information center functions within MIS, the department can benefit from the users' perceptions of enhanced services.

Bordelon: But the two may not fall within the same organization. At Helene Curtis, we have one director responsible for data processing and office services and another for sys-

tems development. When I came on board as information-center director, management told me to have nothing to do with either of them. Never-

theless, I've been able to build relationships with them. I've argued that we can't operate effectively in separate domains. Both directors

have come around to my point of view, particularly the head of systems development.

The information-center concept is

Information-center software

(Cited by roundtable participants)

Application programming

Vendor	Package	Requirements	Price	Circle
Burroughs Contact local sales office	Linc	Burroughs mainframes	\$35,000 to \$72,000	632

Database management

Vendor	Package	Requirements	Price	Circle
Ashton-Tate (213) 204-5570	dBase II	IBM PC and compatibles	\$700	633
IBM Contact local sales office	SQL/DS	IBM mainframes	\$376 per month	684
Infodata Syst. (703) 578-3430	Inquire	IBM 370, 43XX, 30XX, and PCMs	\$55,000 to \$215,000	634
Information Builders (212) 736-4433	Focus	IBM and PCMs under VM/ CMS or MVS	\$43,000	635
Mgt. Decision Syst. (617) 890-1100	Express	IBM 4331 and up under VM/CMS; Prime 250	\$75,000 to \$200,000	636
Texasoft (214) 369-0795	PC File	IBM PC and compatibles	\$75	637

Modeling/decision support

Vendor	Package	Requirements	Price	Circle
Artificial Intelligence (617) 890-8400	Intellect	IBM 370, 43XX, and 30XX	\$49,500 to \$69,500	638
Automated Analysis (213) 255-5599	Wizard	HP 3000	\$10,000 to \$20,000	639
Comshare (313) 994-4800	System W	IBM 43XX and 30XX Distributed version: Integrates IBM PC or XT	\$55,000 to \$100,000 \$80,000 to \$115,000	640
Eagle Computer (408) 395-5005	Eaglecalc	Eagle PC	\$195	641
Execucom Syst. (512) 346-4980	IFPS	IBM mainframes under TSO, CMS, or ICCF; Sperry 1100; Honeywell 66; and Control Data mainframes	\$64,000	642
IBM Contact local sales office	APL-DI Plancode I Plancode/S	IBM mainframes	\$240 to \$264 per month \$764 per month \$625 per month	643
Lotus Development (617) 492-7171	1-2-3	IBM PC and compatibles	\$495	644
SAS Institute (919) 467-8000	SAS	Mainframes under OS, OS/ VS, DOS/VSE, ICCF, TSO, VM/CMS, or SSX	\$7,900 (license)	645
TSI Int'l. (203) 853-2884	Data Analyzer	IBM 360, 370, 43XX, and PCMs	\$14,000 to \$38,000	646

Info Centers

(Continued from page 211)

continually evolving. The participants see their current functions diminishing in importance and new roles springing up. Their predictions:

Tuhy: The information center won't continue to handle training because everyone will eventually be trained. All employees will know how to use the technology and the information center will evolve into a production center.

Johnson: The business-consulting role many information centers play now will take on greater importance. The entire MIS department will take on the appearance of an information

center, with the emphasis on business consulting.

Seidman: The information center now is really a liaison between data processing and end users. But I see information centers broadening their scope to deal with all types of information, acting as communications vehicles for entire corporations.

Feinleib: Information systems in large organizations will be divided into four tiers. At the bottom will be batch or heavy online transaction-processing systems. The next level will provide extracts from the corporate systems. The third level will be

local databases where departments store fairly large amounts of information for their own machines. These will be tied to the corporate databases. Finally, the fourth level will reside on the individual's desk, with more and more powerful personal computers tying into the departmental database.

Sterns: Management-information systems, database management, office automation, graphics, telecommunications—all will merge in the information center. The center will be a bridge into the era of supercomputers and artificial intelligence. □

Information-center software (Cited by roundtable participants)

Modeling/decision support

Vendor	Package	Requirements	Price	Circle
Visicorp (408) 946-9000	Visicalc	IBM PC; Apple micros	\$250	647

Distribution/analysis

Vendor	Package	Requirements	Price	Circle
Ernst & Whinney (617) 647-5300	Logistek	Most mainframes	\$5,000 to \$10,000	648
Transportation Concepts & Svcs. (201) 548-1200	Compu-Rate 4	IBM 370, 43XX, and 303X under OS, DOS, TSO, SPF, or CICS; Honeywell 6400 or 6600 under IDS2/DM4	\$45,000	649

Graphics

Vendor	Package	Requirements	Price	Circle
Graphic Communications (617) 890-8778	Graph-writer	IBM PC	\$395	650
Hewlett-Packard Contact local sales office	HP Graphics (HP Draw, Easy Chart, Decision support graphics)	HP 3000	\$3,000 to \$10,750	651
ISSCO (619) 452-0170	Tell-A-Graf	Machine-independent	\$9,500 to \$91,000	652
SAS Institute (919) 467-8000	SAS/Graph	IBM 370, 43XX, and 30XX; Prime 50 Series; DEC VAX; Data General MV Series	\$5,500 (license)	653

Word processing

Vendor	Package	Requirements	Price	Circle
Eagle Computer (408) 395-5005	Eaglewriter	Eagle PC	\$495	654
Information Unltd. Software (415) 331-6700	Easy Writer I Easy Writer II	IBM PC and compatibles Same systems	\$250 \$395	655
Multimate Int'l. (203) 522-2116	Multimate	IBM PC and compatibles	\$495	656

Micro Modems

(Continued from page 128)

Impell Corp., an engineering consultancy in Walnut Creek, CA, serves utilities. An in-house program called Superpipe analyzes the stress load of pipes used in nuclear power plants and predicts what would happen in the event of a burst pipe. Using Compaq portables and Hayes 1200 Smartmodems, Impell's field engineers can offer up-to-the-minute advice after checking with a DEC VAX-11/780 and a Control Data Cyber 170/825 in Walnut Creek.

Chuck Daniels, Impell's head of computer operations, relies heavily upon the local Computerland for advice in choosing both communications software and hardware. Another modem vendor, Ven-Tel, recently introduced the PC Modem Half Card, an internal modem for IBM portables and compatibles. Priced at \$549, the 300/1,200-baud modem fits inside the computer for true portability.

In an age when information is power, corporate survival may depend on rapid access to a variety of data. Since maintaining an internal library of resources can be expensive, space consuming, and redundant, many corporations have come to rely on a growing number of public databases. Using a modem, users can extract only the data needed, without the trouble or expense of maintaining their own archives.

Many food processors use the Dow Jones news service to keep track of commodity quotes. Other wire services can also help you make better use of funds. One west coast high-technology manufacturer learned through News Net, a national wire service, that the Mexican government was clamping down on money leaving the country. With this tip, the company was able to yank \$15 million out of its holdings south of the border before the restrictions went into effect.

Despite the lure of these public databases, not every personal computer requires a modem. However, as prices drop below \$500 for a combined modem and communications-software package, many users are

buying their own. If you want to standardize, the time to do so is now.

Managers should develop an acquisition strategy, says Fred Stern. Before a company gives an employee a personal computer, the user must determine what he or she needs the

machine for. The same process should be followed when obtaining modems. Without the proper precautions, businesses will risk being overwhelmed by the technology revolution before they have a chance to benefit from it. □

212A



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CIRCLE 86

PERIPHERALS

Advanced terminals

The DEC VT200 ergonomic terminals are compatible with the VT100. Features include programmable function keys, foreign-language character sets, a "crt saver" blanking feature to extend display-tube life, and selective erase. The VT220, an interactive al-



phanumeric terminal with 12-inch monochromatic screen, is \$1,295. Model VT240, a three-piece monochromatic terminal with bit-map graphics, costs \$2,195. The VT241, a full-color, graphics-oriented terminal with 13-inch screen, is \$3,195.

Digital Equipment Corp., Maynard, MA 01754.

(617) 897-5111.

CIRCLE 301

Dot-matrix printer

The Model LG-1500, a 24-pin dot-matrix printer, prints in draft, letter-quality, and graphics mode with a maximum speed of about 200 cps. Price: about \$1,200. The top-of-the-line printer features single-sheet feeder, multiple character fonts, and logic-seeking, bidirectional printing. It operates with serial, parallel, or IEEE ports.

Epson America Inc., 23530 Hawthorne Blvd., Torrance, CA 90505.

(213) 557-1331.

CIRCLE 302

DEC subsystem

The Vault subsystem for DEC LSI, PDP, and VAX systems features a 1/4-inch cartridge tape streamer. Price: \$3,975. It emulates the DEC TS11 1/2-inch tape subsystem and is transparent to operating software and diagnostics. Tape speed is 55 ips and density is 8,000 bpi. The tape drive, power supply and cooling fan, and QBus or Unibus tape coupler are housed in a desk-top cabinet. The coupler handles full 16-bit NPR data transfers. Other features are



self-diagnostics during power-up and a 3.5-Kbyte data buffer.

Emulex Corp., 3545 Harbor Blvd., Costa Mesa, CA 92626.

(714) 662-5600.

CIRCLE 303

Color graphics

The ANSI-compatible CIT-467 terminal allows simultaneous use of DEC alphanumeric software commands, the Tektronix 4027A color-graphics command structure, and Tektronix 4010/



4014-emulation mode. It offers full dot addressability, eight colors with 64 programmable combinations, variable-speed smooth scroll, and five programmable video attributes. Price: \$2,995.

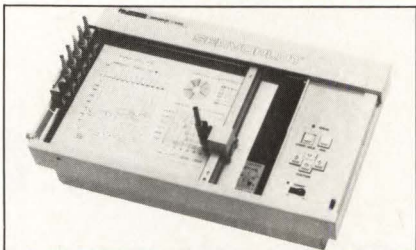
CIE Terminals, 2505 McCabe Way, Irvine, CA 92714.

(714) 660-1421.

CIRCLE 304

Six-pen plotter

The DA 8400 Servoplot is a six-pen, intelligent X-Y plotter with a maximum speed of 16 inches per second. It has



RS-232C, 8-bit parallel, or GPIB/IEEE-488 interface. It comes in both A3 and A4 size, in both flatbed and rollfeed

models, and can function as either a flatbed or rack-mount. Price: \$1,850 for A4 model and \$2,350 for an A3 roll-feed model. It uses water- or oil-base fiber-tip or water-base ballpoint pens.

Western Graphtec Inc., 12 Chrysler St., Irvine, CA 92714.

(714) 770-6010.

CIRCLE 305

Microfilm system

An NCR personal computer controls the NCR 5310 and 5320 Computer Output Microfilm (COM) systems,



which automatically produce microfiche from magnetic tapes formatted by a host. The system consists of the personal computer, a self-loading table-top tape drive for data input, a matrix printer, and a COM recorder/microfiche printer that connects to the personal computer via an RS-232 cable. Price: about \$67,000.

NCR Corp., Micrographic Systems Div., 520 Logue Ave., Mountain View, CA 94943.

(415) 965-3700.

CIRCLE 306

High-quality printers

Xerox 9700 Model V and 8700 Model V electronic printers, enhanced versions of earlier models, are suitable for high-volume publications and other documents requiring a phototypeset appearance. Model 9700 V, which prints up to 120 pages per minute, starts at \$412,000. Model 8700 V, printing up to 70 pages a minute, starts at \$226,000.

Xerox Corp., 880 Apollo St., El Segundo, CA 90245.

(213) 536-7000.

CIRCLE 307

Laser printer

The high-resolution B 9290-30 Intelligent Laser Printing System is compatible with Burroughs mainframes working under both printer and host-software control. Price: \$65,000.

Burroughs Corp., Burroughs Place, Detroit, MI 48232.

(312) 972-7000.

CIRCLE 308

HP printers

Three character-sequential printers and a 300-lpm system liner printer are compatible with various systems, in-



cluding Hewlett-Packard. The HP 2932A general-purpose printer is \$2,495. A factory data printer that produces barcode Model HP 2933A costs \$2,795. Model HP 2934A, a letter-quality distributed office printer, is \$2,895. These three printers will operate with HP 150, 200, 250, 1000, 3000, and 9000 computers. HP Series 300 Model 2563A system line printer, of-

fering multinational and OCR character sets as well as raster graphics and bar codes, is priced at \$5,780.

Hewlett-Packard (Contact your local Hewlett-Packard sales office.)

CIRCLE 309

Compatible terminal

Model 72 terminal is software-compatible with the DEC VT102 and Data General D200. Thirty-two of its keys can be redefined to meet specific applications. It's available with 9-, 12-, and 15-inch screens; the 12-inch costs \$1,535. The Model 72 features two- or four-page volatile or nonvolatile display memory which can be reformatted by the user or computer. Other features are: 256-character buffer, two bidirectional, buffered RS-232 ports, five display attributes, seven area qualifiers, and 224 displayable characters—including line graphics.

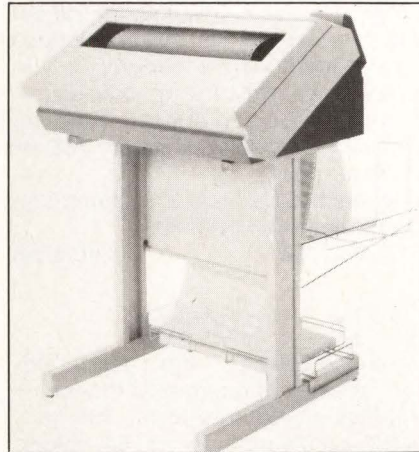
Teleray, Box 24064, Minneapolis, MN 55424.

(612) 941-3300.

CIRCLE 310

Printer enclosure

Soundtrap 136 is an acoustical enclosure that quiets 136-column dot-matrix and smaller letter-quality print-



ers. Price: \$229. Printed material can be viewed through a clear window.

Trace Systems Inc., 900 Sterlin Rd., Mountain View, CA 94043.

(415) 964-3115.

CIRCLE 311

N5500: Good Management Strategy

Increasing profitability by improving productivity and controlling costs is obviously good management strategy. And good managers have found achieving that goal is easier with the help of the N5500 project control system.

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(201) 795-0813

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CIRCLE 92

SYSTEMS

Graphic overlays

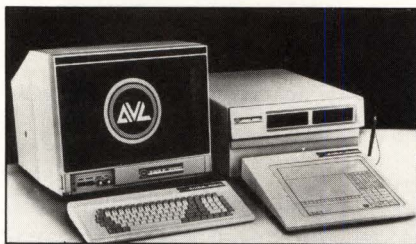
The Graphover 9500 display system can generate overlays on video pictures from a videodisk, videotape, or TV camera. Price: \$10,900. By using a light pen, the user can select functions from a menu, draw directly on the screen, or control other graphic generation. Output can be recorded on videotape or displayed on an RGB or NTSC monitor.

New Media Graphics, 279 Cambridge St., Burlington, MA 01803. (617) 272-8844.

CIRCLE 253

Color graphics

The Eagle 2000 WS-1000 design station creates high-resolution color graphics—both free-form and geometric configurations—in 64 colors. Price: \$19,950. The system offers self-prompting screen commands, image flipping, duplicating, and automatic scaling. It includes 512-K memory, co-processors, two floppy-disk drives,



monitor, digitizing tablet, keyboard, and several software packs. An optional FR-4000 35mm camera/film recorder with interface to produce 35mm slides costs \$29,950.

AVL Inc., 500 Hillside Ave., Atlantic Highlands, NJ 07716. (201) 291-4400.

CIRCLE 254

Program developing

Multipro Application Development System is a program- and system-design tool for VM/CMS or TSO. Price: \$24,000 for the mainframe package; \$1,900 each for workstation software. Minimal configuration PC/XT is about \$7,000. Design and programming of

the system tasks can be downloaded to an IBM PC or XT. The system provides "paperless programming" because all components such as flowcharts and documentation are stored with the source code. It allows the same level of editing capabilities for graphics as for text. Any number of windows of various sizes can be dis-



played and manipulated at one time. Other features include interfaces to popular library systems, calculator, and 3270 or DEC VT100 emulation.

CAP Gemini, 2350 Valley View Lane, Dallas, TX 75234. (214) 247-5454.

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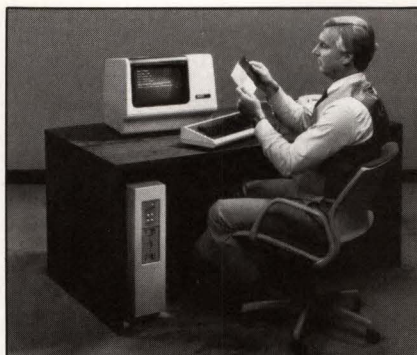
P.O. Box 280 - Necedah, Wisconsin 54646 - Telex 701934

800-356-5794

CIRCLE 121

Low-end VAX

MicroVAX I is a two-board micro-computer that comes as a floor-stand or rack-mountable unit. A model with 800-Kbyte dual floppy-diskette-drive and 10-Mbyte Winchester disk is \$13,880. It's designed for dedicated control applications for single-user or small multi-user tasks. It's also available with 28-Mbyte Winchester. The Unibus-based VAX-11/725 supermini fits under a desk, moves around on casters, and operates quietly. Price: \$24,950 to \$36,800. It uses a Winchester-fixed and removable-disk subsystem with 52 Mbytes of storage. This can serve as a basis for a single-user graphics workstation or as a general-purpose multi-user system for up to eight users. VAXelan is a VMS-compatible development and execution system for building dedicated, real-time applications for MicroVAX, VAX-11/725, 11/730, and 11/750 systems. License fees start at \$8,200; run-time license fee is \$100. Also available



for the MicroVAX products are MicroVMS, operating system, and Ultrix, an operating system based on Bell Labs' Unix.

Digital Equipment Corp., Maynard, MA 01754.
(617) 897-5111.

CIRCLE 256

Bus-based models

A 32-bit bus-based system features high-resolution graphics and a Unix-based operating system and is suitable for applications requiring multiple

or special-purpose processors. An office model with 512-Kbyte memory and 84-Mbyte disk is \$53,450. A rack-mount model with 474-Mbyte disk is \$71,950. End-users who purchase five or more systems receive discount.

Texas Instruments, P.O. Box 402430, Dallas TX 75240.
(800) 527-3500.

CIRCLE 257

Packaged cpu

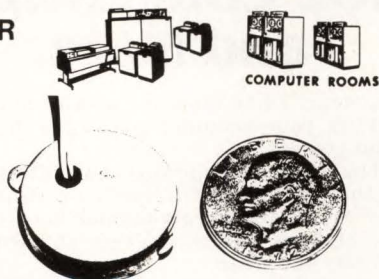
Two Wang packages feature internal disk drives and 32-bit cpus. Model VS 85-76F, with 76-Mbyte 8-inch fixed disk drive, costs \$70,000. Model VS 85-147F, which has 147-Mbyte 8-inch disk drive, is \$77,000. They each have 1 Mbyte of main memory, a 16-port serial I/O processor, an archiving workstation, an I/O processor that supports two disk drives of any combination, and a communications processor.

Wang Laboratories Inc., One Industrial Ave., Lowell, MA 01851.
(617) 459-5000.

CIRCLE 258

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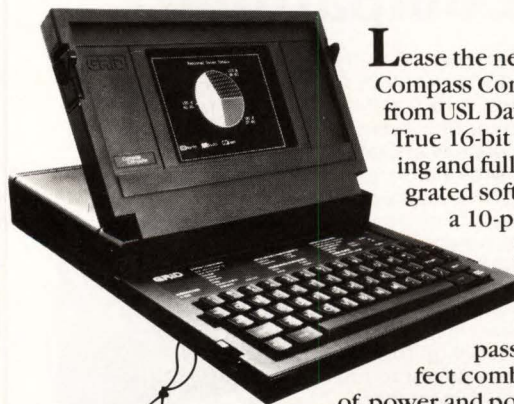
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CIRCLE 94

SECURITY

Network modem

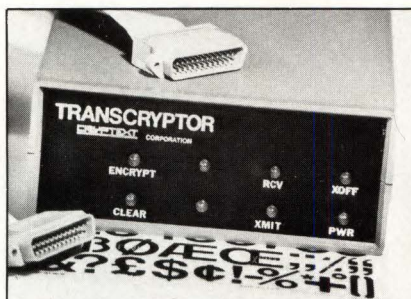
The Oz Guardian full-duplex modem provides security for sensitive networks and applications. Price: \$750 per unit. A call-back feature disconnects incoming calls after the caller's password is received and then redials the number. Triple-lock security prevents network users from accessing confidential data, implementing selected commands, or unlocking those commands.

Tri-Data, 505 E. Middlefield Rd., Mountain View, CA 94039.
(415) 969-3700.

CIRCLE 234

Super-encryption

Transcryptor generates a different encryption key each time it's used, blocking unauthorized access to computers and terminals, including phone access. It provides about 2,300 times as many different possible ciphertexts as the Data Encryption Standard. This black box automatically encrypts mes-



sages upon transmission, decrypts upon receipt, and can be configured to provide managerial control. It automatically resynchronizes when line-noise errors occur. Price: \$945.

Cryptext Corp., P.O. Box 425, Northgate Station, Seattle, WA 98125.
(206) 364-8585.

CIRCLE 235

DEC monitor

The Rabbit-4 Security System, for DEC RSTS/E users, prevents theft and destruction of data. A File Intrusion Prevention component locks files and logs attempts at access by unautho-

rized personnel. Price: \$2,500. The Rabbit-4 accommodates six security levels for 128 data files. A System Intrusion Prevention component is a run-time system and keyboard monitor that restricts activity at specific times and from specific terminals.

Raxco Inc., 1370 Piccard Dr., Rockville, MD 20850.
(301) 258-2620.

CIRCLE 236

Encryption software

Dyl-Security is encryption/decryption software for OS-DOS, and SSX systems running on IBM 360, 370, 30XX, 43XX, and plug compatibles. Price: \$1,000 (may also be leased). The Dyl-Security can encrypt over 90,000 bytes per second on an IBM 3033. The seven-byte key resides outside the module so the user doesn't have to invoke a clearing program after processing.

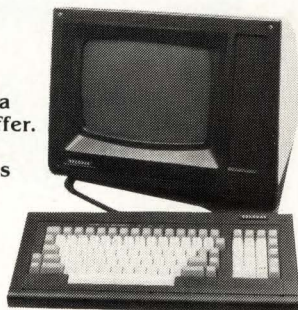
Dylakor, 17418 Chatsworth St., Granada Hills, CA 91344.
(818) 366-1781.

CIRCLE 237

D200 and ANSI Compatibility

Our new Model 7-DDG talks both Dasher* D200 and DEC* VT102 (ANSI X3.64). It is the only terminal that does. As a D200, it has all the features you want, including dedicated user function keys and hidden display attributes. In DEC mode, it's a VT102, with a more extensive ANSI code set.

The 7-DDG has two or four pages of display memory, smooth horizontal and vertical scrolling, two bi-directional RS232 ports and a 256-character input buffer. And it stores up to 32 programmable functions in nonvolatile memory. It even has a time of day / elapsed time clock.



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*DEC and VT are registered trademarks of Digital Equipment Corp.

CIRCLE 95

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Our new Model 7-DEC talks and acts so much like a DEC* VT102, your computer won't know the difference. But you will.

You'll have at your fingertips capabilities that far exceed those of the VT102: Multi-page display memory. Nonvolatile programmable functions. Redefinable keys. 25th status line. 15" display.

You'll also be able to change control codes, in it's alternate **user definable mode**, to make the 7-DEC act like a DG, Hazeltine, LSI, or some other asynchronous terminal, as well as a VT102.

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DEC* VT102 is a registered trademark of Digital Equipment Corp.

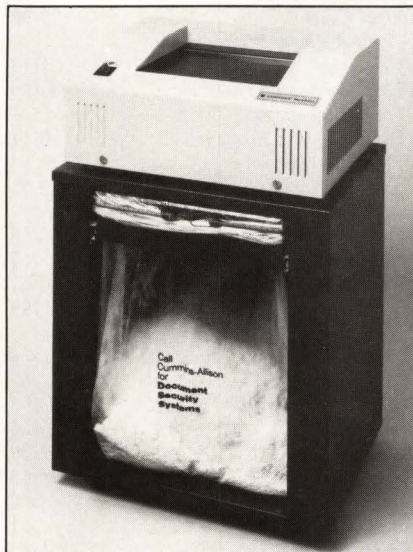
CIRCLE 96

For transmitted data

A pair of security units, DCP4010 and DCP4015, prevents unauthorized access to data transmitted over telephone lines. The two also eliminate transmission errors for users of asynchronous terminals. The units, programmed with a code, are installed at each end of the data link, and if the originating-unit code does not match the answer unit, the answer unit will not respond. There is a 16-Kbyte buffer, and a signal protects against buffer overflow. Price: \$600 to \$750 each, depending on quantity.

Datatel Inc., Cherry Hill Industrial Ctr., Cherry Hill, NJ 08003.
(609) 424-4451.

CIRCLE 238



Particle shredder

Model CA-48 medium-volume shredder cuts paper into particles measuring $\frac{1}{32}$ -by- $\frac{3}{8}$ -inches. It accepts both sheets and continuous-form printouts. Price: \$6,499. The shredder

comes with a steel cabinet housing a plastic bag; a bag-overflow device notifies the operator when the bag is full.

Cummins-Allison Corp., 891 Feehanville Dr., Mt. Prospect, IL 60056.
(312) 299-9550.

CIRCLE 239

Software encryption

Descript+, which runs on IBM mainframes, has automated key management. Permanent license fees begin at \$4,500. DES keys are created and stored by the program and do not have to be entered into programs or passed through parameter lists. The system can be used to encrypt or decrypt particular character fields, records, or entire files.

Prime Factors, 6529 Telegraph Ave., Oakland, CA 94609.
(415) 654-5090.

CIRCLE 240

PC encryption

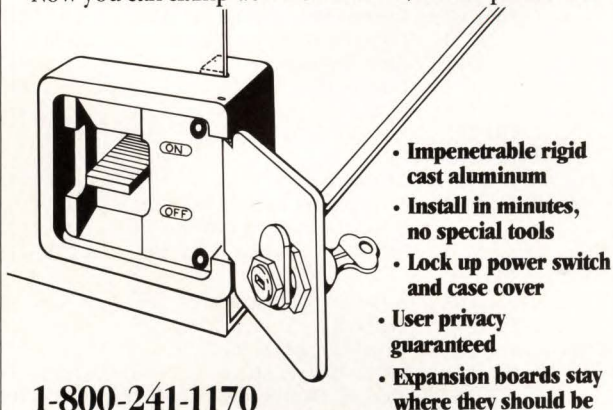
The DEB Data Encryption Module, for the IBM PC, XT, and compatibles, allows encryption/decryption of any disk file—including user-written programs in any language. Price: \$400. An optional utility secures disk drives.

Okio Data, 3495 St. Martin, Laval, Quebec H7T 1B7.
(514) 681-1681.

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SOFTWARE

Cobol system

An application-development system running under CICS/VS or VM/CMS enables Cobol programmers to write online transactions for 3270 devices in standard ANSI Cobol, reducing the dependency on CICS and CMS skills. Called UFO/Cobol, it generates Cobol source statements from screen painting, a free-form interactive design of the screen. Thus, Cobol language extensions replace CICS or CMS code requirements. Price: \$24,000 for DOS, \$33,000 for OS.

Oxford Software Corp., 174 Blvd., Hasbrouck Heights, NJ 07604.
(201) 288-1515. **CIRCLE 248**

Accounts receivable

Fin-Pac/38 Accounts Receivable System for the System/38 is suitable for many industries, as well as multinational businesses. It performs online data entry, validation, posting, file maintenance, and inquiry, and offers flexible reporting functions. It also

offers foreign-currency conversion and value-added tax support, and has a translation facility for use in non-English-speaking countries. Lease price: \$5,000.

Arthur Andersen & Co., 33 W. Monroe St., Chicago, IL 60603.
(312) 580-0033. **CIRCLE 249**

Marketing modules

Five integrated marketing modules for the IBM System/36 correlate data from marketing, sales, advertising, and service departments and can generate custom reports from over 100 data fields. Prices begin at \$4,200 for purchase or \$140 per monthly rental. The five packages are: a customer/prospect information base, inquiry handling and lead analysis, field-sales management, customer sales history, quotation/proposal evaluation, and field-service management.

Waters Business Systems Inc., 47 New York Ave., Framingham, MA 01701. (617) 879-2503. **CIRCLE 250**

Data distribution

Data Center Distribution System (DCDS), an online package running on medium-to-large IBM mainframes under MVS, helps control the format, length, routing, and distribution of reports. Prices start at approximately \$40,000. The DCDS tracks reports from start to hard-copy delivery and generates forecasts of report production and availability. It prints only those parts of a report that recipients ask for. Reports to be printed at the same time for the same maildrop location are printed in unbroken sequence to form a bundle and are delivered whole for distribution to recipients.

Value Computing Inc., 498 N. Kings Hwy., Cherry Hill, NJ 08034.
(609) 482-2500. **CIRCLE 251**

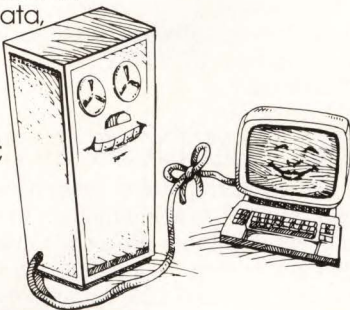
VAX software: A distribution system for VAX computers is available from Computer Data Corp. in Los Angeles. It runs under ANSI Cobol. **CIRCLE 252**

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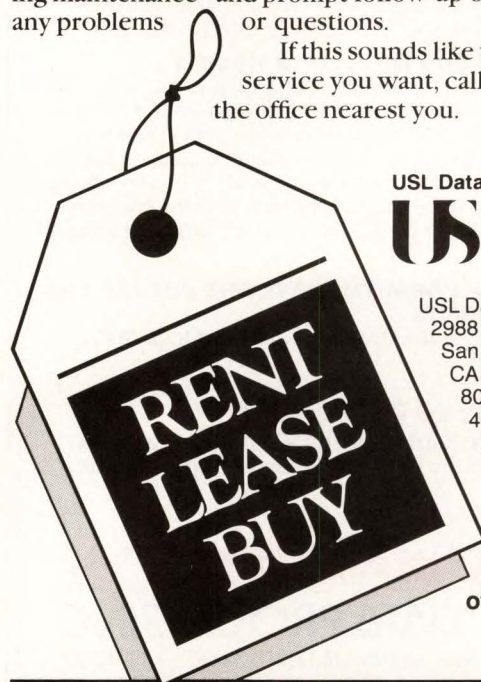
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Midcom Corp., 1940 N. Tustin, Orange, CA 92665.

(714) 998-6041.

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Manufacturing Software Systems Inc., 85 Allen Martin Dr., Essex Junction, VT 05452.

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DEC and DCA Autonet link

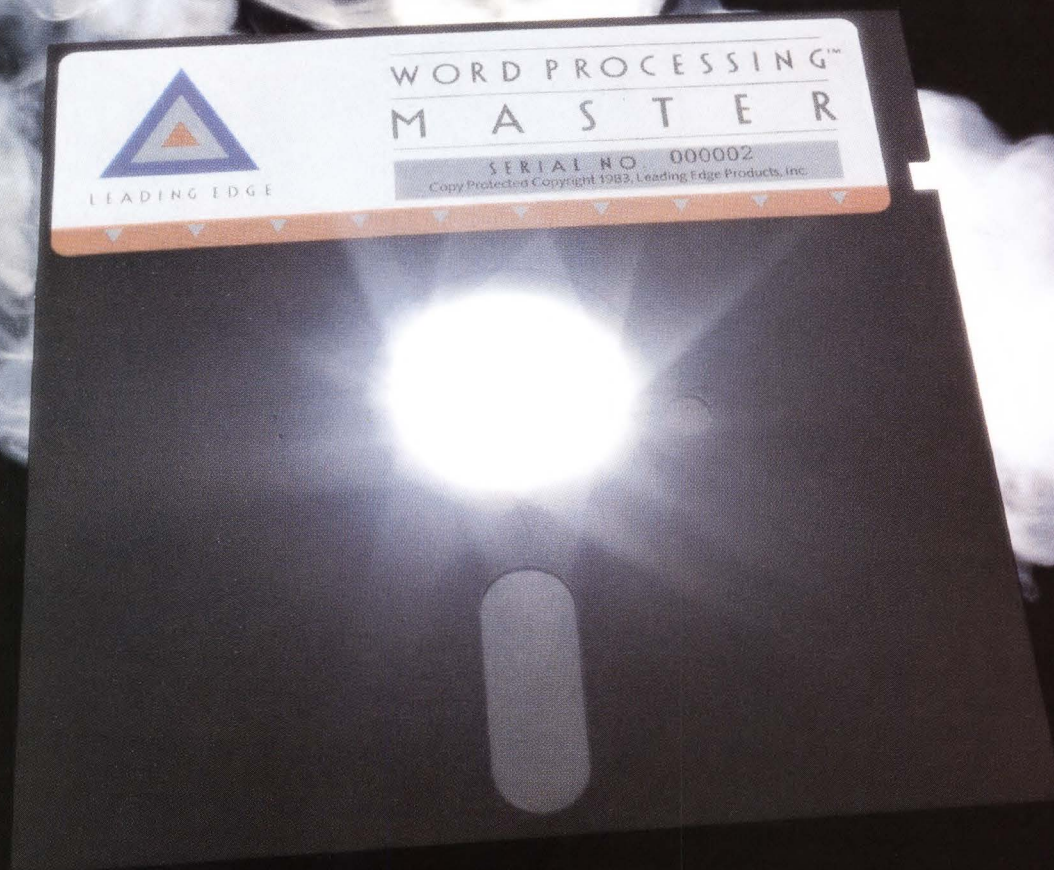
DEC Unibus-compatible systems and DCA communications products can link directly with the ADP Autonet public data network without protocol conversion. Price: \$4,000 to \$6,000, depending on number of ports. A modified version of the DCA System 205 Unibus-Interface Statistical Multiplexor provides one synchronous network connection and emulates up to 128 DZ11 equipment ports.

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